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USFWS Greenspaces Program
Final Project Report

Raindrops to Refuge

A Sherwood Community Watershed Stewardship Initiative

Cooperator:	City of Sherwood	**Project Title:**	Raindrops to Refuge
Coop. Agreement:	6505.0105 13420-01-J140	**Project Period:**	January 2002 to January 2003
Report Date:	April 21, 2003	**Project Contact:**	Ken Huffer, Natural Resource Specialist

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Project Description

This project will support a coordinator position for the purpose of developing a comprehensive, multi-disciplinary approach to the conservation and restoration of watersheds around and within the City of Sherwood. Raindrops to Refuge will focus on the collection of natural resource information and the development of an action plan to direct conservation, restoration, education, and outreach strategies for the Cedar Creek, Chicken Creek, and Rock Creek watersheds to benefit fish and wildlife and their habitats.

R2R will use its Action Plan to guide restoration, conservation, education and outreach activities, programs and planning with its local, regional and federal partners. To ensure cooperation with these partners, R2R has invited them to participate on both its Advisory Committee and Sub committees since its inception in April 2001. These partners have been intimately involved and are heavily invested in the Plan's conception and final strategies and recommendations. The resources, skills and volunteer effort needed for recommended projects will rely on these partners and their pledges of support. Examples of management implications from the Action Plan include:

- Working with the City of Sherwood and the Audubon Society of Portland on state-wide land use planning for wildlife habitat and riparian corridor connections and protection;
- Collaborative restoration projects with City of Sherwood, Clean Water Services and Friends of Trees to restore Sherwood's main city park along Cedar Creek;
- Private, voluntary land conservation outreach and partnerships with private landowners and Three Rivers Land Conservancy to preserve headwater areas of Chicken and Cedar Creek;
- Recommendations to City of Sherwood regarding expansion of urban growth boundary and future development of recently included "urban reserves" along stream corridors;
- Recommendations to City of Sherwood regarding future acquisitions for expansion of public greenway system along Cedar Creek and trail connections with the Refuge.

Background

The Tualatin River National Wildlife Refuge and the City of Sherwood, (fastest growing city in Oregon at a rate of 281% since 1991) have been partnering for over a decade to promote ecological sustainability by:

- Promoting the health of the Tualatin River Watershed
- Enhancing community stewardship
- Developing a healthy eco-balance between developed and natural areas
- Restoring and enhancing habitat within an urban setting for native fish and wildlife

This ecological stewardship project is part of the larger sustainability initiative for which the Sherwood community is recognized by the United Nations. This sustainability effort facilitated Sherwood residents, teachers, youth, and representatives from the City of Sherwood, Tualatin River National Wildlife Refuge, Audubon Society of Portland, Friends of the Refuge, Tualatin River Watershed Council and the Tualatin Riverkeepers meeting in the spring of 2001 to implement the goals of the Sustainability Vision. This Vision for environment and open spaces stated that, "a sustainable Sherwood is a healthy and livable community that fosters long-term goals to maintain a strong sense of

community to encourage a stable and balanced economy and to promote biological diversity and wisely manage our natural resources."

These stakeholder groups, local organizations and private residents were increasingly concerned about the detrimental impacts of growth on the Sherwood community, watershed health, the Refuge, bird habitat, wildlife corridors and the Tualatin River. These same people and groups were also seeking innovative ways to get actively involved in finding a solution. There are also larger agencies and organizations, such as Clean Water Services, Metro Regional Services and Three Rivers Land Conservancy, that are eager to apply their regional stream assessments, land use and habitat modeling, and watershed plans at a local, sub-watershed level and see R2R as a perfect opportunity to do that.

Within four months, this group of stakeholders evolved into a formal Advisory Committee for its new Sherwood Community Watershed Initiative: Raindrops to Refuge. The Committee created and adopted the following Mission **"To inspire, educate and facilitate community actions to assess, restore and preserve the ecological health of Sherwood's watersheds."** One of the first priorities that the Committee addressed was the need for improved coordination and the leveraging of resources with other groups, citizens, jurisdictions and agencies working in the watersheds. To effectively meet this need – both short and long-term - the Committee recognized the benefits of developing an Action Plan to guide future activities and programs related to R2R's four focus areas: Outreach, Education, Conservation and Restoration.

Goals and Objectives

Conservation

Guide conservation efforts, prioritize land acquisitions, and recruit local and regional land trusts to protect lands with acquisitions and conservation easements. Collaborate with City of Sherwood to develop recommendations for City's Goal 5 Program, greenway expansion and land use planning.

1. "Mapping Priority Areas for Restoration and Conservation": Identify and map current conditions, allowable land uses, and significant natural resources in the watershed. Use this information to identify conservation and restoration opportunities, challenges and priorities, and to develop strategies to restore or conserve these areas. Considers both private and public lands, urban and rural areas. Create GIS watershed map showing "Conservation/Restoration Priority Areas"
2. "Private Voluntary Land Conservation" Work with private landowners, and local and regional land trusts, including American Farmland Trust and Three Rivers Land Conservancy, to identify key conservation areas and facilitate land acquisitions and conservation easements.
    a. Headwater areas of Chicken, Rock and Cedar Creeks are identified in Clean Water Services' Watersheds 2000 Stream Inventory as conservation priority areas.
3. "Land Acquisition Priorities within the City of Sherwood" Use Conservation/Restoration Priority Area Map to help guide City of Sherwood planning for future land acquisitions along stream corridors and floodplains.
    a. Key values in identifying priority areas: habitat values, passive recreational opportunities, trail system, watershed function, and contiguous to already conserved lands
4. "Goal 5 Planning for City of Sherwood" Collaborate with City of Sherwood planners to 1) help develop the City of Sherwood's response to Goal 5 requirements and 2) identify habitat resources within the City of Sherwood.
        i. Wildlife Habitat Assessment Project will inform Goal 5 Planning

Restoration

Collaborate with the City of Sherwood, local and regional stewardship groups, Refuge managers, and private landowners to organize and implement restoration activities on urban and rural lands, both private and public.

1. "Mapping Priority Areas for Restoration and Conservation": Identify and map current conditions, allowable land uses, and significant natural resources in the watershed. Use this information to identify conservation and restoration opportunities, challenges and priorities, and to develop strategies to restore or conserve these areas. Considers both private and public lands, urban and rural areas. Create GIS watershed map showing "Conservation/Restoration Priority Areas"
2. "Restoration for Publicly Owned Riparian & Open Space Areas": Collaborate with City of Sherwood, local students and schools, and community and regional stewardship organizations to restore publicly-owned properties along Cedar, Chicken and Rock Creeks within the City of Sherwood and Tualatin River

National Wildlife Refuge, which have been identified as a "Conservation/Restoration Priority Area."

3. "Riparian Habitat Restoration on Private Lands": Provide technical and financial assistance to private landowners to voluntarily restore wetlands and other fish and wildlife habitats on their lands. Focus on areas that have been identified as a priority.

Education

Educate and inform Sherwood youth and adults about watershed protection. Show them how their actions impact watershed functions, public greenway, and neighboring Refuge. Provide them the resources they need to be good watershed stewards.

1. "Water Quality Monitoring on Cedar Creek": Develop or enhance existing water quality monitoring activities by middle and high school teachers and students to collect water quality data in a consistent and efficient manner for tracking purposes. Program will serve as a pilot project when considering future monitoring programs for Chicken and Rock creeks. To begin September 2002 and be ongoing.
2. "GIS Watershed Mapping Program": Continue to develop program with local students and teachers in the Middle and High Schools to support Raindrops to Refuge programs, grant proposals, and conservation and restoration mapping.
    b. Program would support WQ Monitoring, Wildlife Habitat Assessment, and creation of R2R trail-watershed map, annual poster and calendar.
3. "Homeowner Education and Awareness Program": Develop, sponsor and facilitate two pilot education and awareness programs to raise educate and inform private homeowners about watershed-friendly practices for the home and yard, i.e. Naturescaping, site planning, stormwater runoff, noxious weed identification and control, etc. To begin April 2002 and be ongoing.
    c. **Neighbor to Neighbor Workshops**: R2R members organize, host and facilitate monthly neighborhood gatherings and mini-workshops to promote watershed-friendly home/yard care, community awareness re: watershed function, fish and wildlife habitat, and publicly-owned greenway and trail system.
    d. **Community-wide Workshops**: R2R sponsors and organizes quarterly workshops in conjunction w/local and regional partners to bring existing homeowner education instructors and workshops to the Sherwood Community to promote watershed friendly home and yard care, community awareness re: watershed function, fish and wildlife habitat, and publicly owned greenway and trail system.
4. "Wildlife Habitat Assessment Program": Develop partnership program w/Naturemapping/Cybertracking team, local students and teachers, and PSU Capstone classes to collect, compile, analyze and report out data on wildlife migration and habitat values for City of Sherwood properties. To begin March 2002 and completed by August 2002.
    e. Pilot project for 2002 to collect and compile data for city-owned properties along Cedar Creek. GIS Program would provide mapping assistance to display wildlife habitat data spatially and graphically.
    f. Based on success, may be expanded to Chicken and Rock Creeks.

Outreach

Increase community awareness re: R2R's mission, Tualatin River National Wildlife Refuge, City of Sherwood greenways and the benefits of healthy watersheds. Inspire and mobilize Sherwood residents, landowners, city planners and developers to take private, voluntary actions to improve watershed health on both private and public lands.

1. "Raindrops to Refuge Brochure": Develop a color brochure to publicly present R2R vision, mission, goals and accomplishments at community and regional events. To be completed and printed by August 2002 and include R2R logo, photographs, map displaying watershed boundaries, City of Sherwood, greenways and trail system, and Refuge properties.
2. "Raindrops to Refuge Display Board": Develop a display board to publicly and graphically present Raindrops to Refuge's vision, mission, goals and accomplishments at community and regional events. To include color photographs, watershed maps, R2R logo and mission and completed by April 2002.
3. "Disseminate Watershed-Friendly Stewardship Literature": Review, collect and circulate existing literature to promote watershed stewardship, noxious weed identification, salmon-friendly practices, erosion preventions, etc., in conjunction with R2R brochure at community and regional events.
4. "Painted Plate Project": Work with City of Sherwood Staff, Sherwood Middle School and Sherwood Sustainability Institute to develop and carry out trail signage and ceramic tile project. To be completed by December 2002.
5. "Monthly Speaker Series": Organize and host monthly speaker presentations in the City of Sherwood to promote community awareness and appreciation for watershed health, greenways and trail system, fish and wildlife habitat, and the Wildlife Refuge. To begin June 2002 and be ongoing.
6. "Monthly/Weekly Trail Walks": Organize, lead and/or facilitate *monthly or weekly* trail walks for Sherwood residents and representatives from local and regional organizations to learn more about the opportunities and challenges of protecting, restoring and managing Sherwood's greenway and trail systems for the benefit of fish, wildlife and people. To begin June 2002 and be ongoing.

Accomplishments

Raindrops to Refuge has organized into 1 Advisory Committee, 3 subcommittees, and 1 task team to accomplish R2R's mission and adopted goals. The R2R Advisory Committee is made up of Sherwood residents and partnering-agency representatives and this committee provides guidance and oversight for the Coordinator and subcommittees (all of the Advisory Committee members also serve on a subcommittee). Each subcommittee is categorized by one of R2R's four Work Plan Areas, while the task team was initiated for sustainability and organizational development.

Restoration/Conservation

Primary focus has been to identify geographical area of focus and existing data sources, gathering and compiling information, review and analyze maps and data matrices and develop Work Plan/Timeline and Outline for completing Draft R2R Action Plan by January 2003. Action Plan will identify conservation and restoration priorities and guide R2R and its partners as they build and carry out homeowner and youth education, community outreach, restoration and conservation activities and programs in Chicken, Rock and Cedar Creek watersheds. Accomplishments:

1. Conservation/Restoration Sub Committee developed and approved outline, goals and purpose for proposed Action Plan.
2. Coordinator researched and created inventory of existing data, reports, surveys, models and assessments that included Sherwood's three watersheds.
3. Coordinator compiled and reviewed existing data from Clean Water Services, Metro Regional Services, Tualatin River Watershed Council, Tualatin River National Wildlife Refuge, City of Sherwood and Oregon Department of Fish and Wildlife.
4. Coordinator summarized methodologies for each of the data sources being considered by Cons/Restoration Sub Committee.
5. Coordinator and Conservation and Restoration Sub Committee developed maps and matrices to review and analyze Clean Water Services' stream survey data and findings from the Lower Tualatin Watershed Assessment and ODFW Fish Survey.
6. Conservation and Restoration Sub Committee identified data gaps and errors and are working to collect data as needed for Action Plan.
7. Coordinator developed partnership with Cybertracking/Naturemapping, PSU Community Geography Project and PSU's Capstone Program to collect field data on non-native invasive species and wildlife corridors along Cedar Creek's public greenway.
8. Conservation and Restoration Sub Committee participated in half-day tour to visit a sampling of reaches, both private and public, in the Cedar Creek watershed to verify data collected by Clean Water Services.
9. Coordinator coordinated site visit with Three Rivers Land Conservancy and private landowners Mandy and Jeff Demaine to tour their property along a Chicken Creek tributary. The Demaines were interested in working with R2R and Three Rivers to prevent extensive logging on an adjacent property and to protect the natural resources on their own land.

10. Coordinator organized a site tour in response to a request from private landowner Clint Larson. Mr. Larson needed assistance to restore stream corridor and wildlife habitat on his 11-acre property along Cedar Creek tributary. Other representatives invited on the site tour were Chris Hamilton from USFWS' Partners for Wildlife, Steve from SOLV, and Matt Dunnahoe from Washington County Soil and Water Conservancy District.
11. Coordinator organized initial meeting with representatives from Clean Water Services, Tualatin Riverkeepers, Soil and Water Conservation Districts from East Multnomah and Clackamas County, Metro Regional Services and Tualatin River Watershed Council to discuss the future of "Naturescaping for Clean Rivers Workshops" for the Tualatin Basin. Next steps were developed at the meeting and partners continue to be working together to sustain program for Tualatin Basin communities.
12. Coordinator attended a meeting with the Tualatin Basin Natural Resources Steering Committee in June to introduce the group to R2R and learn about their planning process and how it might relate to R2R's proposed Action Plan.
13. **Finalized Action Plan Outline and 25 Strategies** associated with each of R2R's four goal areas: 1) Conservation, 2) Restoration, 3) Education/Outreach, and 4) Assessment/Monitoring.

Education

This program area is addressed by 2 subcommittees, Youth Education and Homeowner Education, to better address the specific needs of each category.

1. Youth Education: R2R main function has been to provide a forum for better coordination among the various local and regional groups promoting and carrying out youth education programs in Sherwood's watersheds. This function has facilitated cooperative programs and activities between Sherwood YMCA and Earth Force for summer camps, Sherwood Middle School and City of Sherwood for restoration projects, R2R and Sherwood Middle school students to staff R2R displays, and Sherwood Institute for Sustainability, City of Sherwood and Sherwood students to complete Painted Plate Trail Signage program. Sub Committee will consider ideas for new programs that are R2R-specific, as appropriate. Accomplishments:
    a. Assisted with coordination for Painted Plate/Trail Signage project with City of Sherwood, Sherwood Institute for Sustainability, Home Depot's Team Depot and Sherwood Public Schools.
    b. Began Feasibility Study in October 2002 on proposal to create a Community Naturescaping Demonstration Garden in Sherwood.
    c. Coordinator worked with Diane Besser from PSU Community Geography Project and Sherwood middle school students to manage laptop display at Migratory Songbird Festival at the Refuge. Students used GIS ArcView software, data from Metro Regional Services and R2R's watershed map to show Sherwood residents where they lived in relation to Chicken, Rock and Cedar Creeks.
    d. Coordinator met with Michelle DeBoard, Vice Principal for Sherwood High School, to discuss new CIM and CAM curriculum and how R2R

might work with school administrators and teachers to develop curriculum, in class presentations, and fieldwork.

e. Coordinator met with Sherwood schoolteachers Bert Diamond, Cynthia Depree, Dorene Steffeck and Paul Niebergall to introduce them to R2R and discuss how R2R might work with local teachers and students to engage students more in natural resources, public greenway and volunteer opportunities with R2R.

2. Homeowner Education: Most Sub Committee members are Sherwood residents. Consequently, the focus on this group has been to create outreach materials, seek out and take advantage of outreach opportunities in the community and begin a Homeowner Education Workshop pilot project for Sherwood residents. Accomplishments:

   a. Sponsored and held four workshops (May, July, October, and November) for 80 local residents

      i. Three of the workshops were "Neighbor to Neighbor" workshops, presenting information about Raindrops to Refuge, the Tualatin River National Wildlife Refuge, the City of Sherwood Greenway system, and landscaping with native plants.

      ii. The fourth workshop was a "Naturescaping for Clean Rivers" workshop on October 12, open to all watershed residents.

   b. Solicited and received donations of native plants from Bosky Dell Natives and Ash Creek Forest Management Nursery to give away as door prizes at homeowner workshops.

   c. Patt Opdyke (Naturesheds Consultant, Washington County CPO Coordinator and OSU Master Gardener) has been volunteering w/ R2R to present at homeowner workshops (July and November)

   d. Pre-workshop bird walks along greenway guided by Urban Naturalist Mike Houck from Audubon Society of Portland for workshop participants (May and July)

   e. Funding from Regional Water Providers Consortium ($750) to co-host "Naturescaping for Clean Rivers" workshop on October 12th, w/East Mult. Soil & Water Conservation District.

      i. Over 35 residents attended; Naturescaping presenters noted that our participant turnout was the largest for all workshops hosted in the Portland metropolitan area.

   f. Developed informational "Sherwood Native Plants" brochure to provide homeowners a complete list of all plants and trees to use in landscaping their yards.

   g. Initiated a partnership with YMCA Merry Walkers in September 2002 to develop a "Cedar Creek Greenway Nature Walk" Program providing free monthly guided trail walks to Sherwood residents. Members of R2R and Merry Walkers would serve as trail guides. First walk tentatively scheduled for January 2003.

h. Solicited and received a donation from Tualatin Basin Public Awareness Committee ($750) to co-host w/R2R a "Family Naturescaping Event" in Sherwood for Sherwood families in spring 2002.

i. Develop inserts for water bills to offer "helpful hints" for being better watershed stewards with regards to water conservation, landscaping and lawn care. Project is in partnership with Clean Water Services to assist with insert design, printing and mailing costs. To begin in January 2003.

j. Began the development of (*in progress*) 300 Sherwood Watershed Guidebooks as a "Welcome to Sherwood Watersheds" packet for new residents, partnering with Portland General Electric to assist w/printing and binding costs.

k. Submitted three grant proposals to support R2R Education Programs for Sherwood residents.

Capacity Building Task Team

To sustain R2R and its capacity to carry out the Action Plan, this effort has concentrated on: 1) Committee Development, 2) Grant seeking to support Coordinator position past January 2003, 3) Two Year Work Plan, and 4) Financial Sustainability.

1. Finalized R2R's Scope of Work, Vision, Mission and Goals.
2. Formed 4 Sub Committees to guide and develop R2R programs and long term sustainability.
3. Submitted project proposal to PSU's Masters of Urban Planning Program to recruit graduate student team. Team would develop Community Outreach Strategy to solicit public feedback on Draft Action Plan. TBA in February 2003.
4. Received an AmeriCorps Member, Julia Crown, who is serving as R2R's part-time Assistant Program Coordinator from September 2002 to September 2003.
5. Recruited City Council Member Keith Mays to be a member of R2R's Advisory Committee.
6. Sherwood City Council and Parks Board approved Chris Neamtzu as R2R's recommended candidate to sit on the City's Parks Board.
7. Completed R2R's Two-Year Work Plan (July 2002 – July 2004).
8. Submitted three grant proposals to support organizational development and capacity building.
9. **Awarded $35,000 from the National Fish and Wildlife Foundation** on November 1, 2002, to support Coordinator position, organizational development, and Public Input on Draft Action Plan.
10. **Awarded $7,000 from the Metropolitan Greenspaces Education Grant** to support Coordinator position and R2R education/outreach programming.

Outreach

The Advisory Committee and all of the subcommittees all contribute to meeting R2R's goals for Outreach. Accomplishments:

1. Designed and printed 600 tri-fold color R2R brochures for public distribution.

2. Partnered w/PSU Cascade Earth Force to purchase lightweight triptych display board for R2R presentations. Designed display board with color GIS maps, digital photography, and R2R vision, goals and programs.
3. Update R2R's web page to reflect revised Mission, Vision, goals, programs, Sub Committees, scope of work, geographical focus area and partnerships.
4. Update R2R Display for Sherwood YMCA's Bulletin Board (monthly) to promote R2R programs and watershed stewardship.
5. Hosted display booth and watershed model demonstrations at six "Music on the Green" events and Migratory Songbird Festival at the Refuge.
6. Donation from local photographer Michael Wilhelm to use his photography in R2R brochure and display board.
7. R2R featured in three newsletters produced by Friends of the Refuge, Tualatin River Watershed Council, and Three Rivers Land Conservancy. *The Sherwood Gazette* has featured R2R in four articles addressing greenway stewardship, homeowner workshops, TRWC award and personal interviews with R2R Advisory Committee members.
8. Coordinator, with assistance from City of Sherwood's web master, updated R2R's web page to reflect revised Mission, Vision, goals, programs, Sub Committees, scope of work, geographical focus area and partnerships.
9. Coordinator and Margot Fervia Neamtzu designed and prepared R2R Display Board with color GIS maps, digital photography, vision and goals.
10. Coordinator presented PowerPoint slide show for Sherwood City Council.
11. Coordinator, students, Diane Besser and Julie Reeder hosted display booth at Friends of the Refuge's Migratory Songbird Festival at the Tualatin River National Wildlife Refuge. Display included watershed tabletop model, Laptop computer with GIS ArcView software, R2R Display board and various brochures from R2R partners.
12. Advisory Committee members produced 3 of 6 proposed informational "inserts" to enclose with R2R brochure. Completed inserts address: 1) Native plants and trees for Sherwood Watersheds, 2) R2R Advisory Committee and Recruitment, 3) Homeowner Education Workshops.
13. **Received Award from the Tualatin River Watershed Council for "outstanding accomplishments in watershed stewardship." Award received at Annual Dinner and Award Celebration on October 19, 2002.**

14. Received 2005 Tualatin Riverkeepers Green Heron award.

Project Timeline

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Introduction to R2R ~ Read through R2R materials, meeting minutes, grant proposal and web page ~ Interview committee members and community and regional partners ~ Establish an organizational framework for R2R meetings, participation and collaboration with other organizations (January Mtg.) ~ Form three sub committees according to R2R goals: Education, Outreach, Conservation and Restoration ~ Recruit additional stakeholders for Committee membership	√	√												**Refine Work plan, geographical focus and products for 2002** ~ Coordinator understands vision, goals and expectations for R2R program ~ Committee members reach consensus/refine R2R vision, goals, work plan, geographical focus, and tangible outcomes for 2002. ~ Organizational framework to communicate w/R2R Committee and involve community partners in work plan. ~ Three Sub Committees for Youth Education, Homeowner Education/Outreach, and Conservation/Restoration

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Data Inventory and Collection for all three watersheds ~ Coordinator collects, compiles and digitizes (as needed) existing data for geographic area (Chicken, Rock and Cedar creeks). Collaborate with R2R partners: o Local schools/students, City of Sherwood, TRWC, Clean Water Services, Metro Regional Services, Tualatin Riverkeepers, Portland State University, Washington County SWCD, Natural Resource Conservation Service, and Three Rivers Land Conservancy. ~ Coordinator presents and reviews data resources inventory and assessment format with Committee. Solicit Committee input and assistance to collect, review and analyze existing data, identify alternative data sources and conduct field verification. (February Mtg.)		√	√	√	√	√	√							**Draft Inventory of Data Resources for Committee review and comment. Inventory may include the following:** ~ Tualatin River Watershed Assessment produced by TRWC and SWCD ~ Fish Surveys to be completed by CWS, ODFW and TRWC in Jan 2002 ~ Stream surveys completed by CWS for Watersheds 2000 ~ Metro Goal 5 and Regional Greenspaces ~ Data gaps
Identify Missing Data ~ Sub Committee assesses what additional information is needed to complete assessment and obtain it. (March mtg.) ~ Coordinator works with Sub-committee members to collect and incorporate data into assessment. (April mtg.) ~ Coordinator develops partnership with Cybertracking/Naturemapping Program and Community Geography Project to conduct wildlife, wildlife habitat and invasive species surveys through the fall of 2002. (April)			√	√	√									**Finalize Inventory of Data Resources** ~ Research, identify or collect existing studies, reports and data. ~ Partnership to conduct wildlife, wildlife habitat, and vegetative surveys along public greenway in Cedar Creek watershed.

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Cedar Creek: Compile and Review data and Develop Criteria ~ Coordinator compiles and presents data and watershed map to Sub-Committee for review and comment. (May mtg.) ~ Sub-Committee reviews data compilation and works individually to brainstorm procedures and criteria for identifying restoration and conservation priorities in Cedar Creek. Prepare ideas for June mtg. ~ Sub Committee conducts field verification. (June mtg.) ~ Sub-Committee works together to develop conservation and restoration criteria to analyze and rank each reach for priority (June mtg.) ~ Coordinator uses this protocol to weigh and rank data points for each reach according to agreed upon criteria. Coordinator develops written protocol and final maps for Cedar Creek. Present information to Sub Committee. (July mtg.)						√	√	√						**Assessment protocol and Criteria for prioritizing reaches in Cedar Creek** ~ Sub Committee has selected process for assessing survey data and maps and ranking watershed reaches in Cedar Creek ~ Coordinator summarizes assessment and ranking process and produces final map identifying conservation and restoration priorities for Cedar Creek ~ Sub Committee completes field verification for Cedar Creek with CWS representative

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Chicken Creek: Compile and Review data and Develop Criteria ~ Coordinator compiles and presents data and watershed map to Sub Committee for review and comment. (July mtg.) ~ Sub-Committee develops criteria to analyze and rank each reach for conservation and restoration (early August mtg.) ~ Weight data points for each reach according based on criteria and ranking approved by Sub-Committee (early August mtg.)							√	√	√					**Assessment protocol and Criteria for prioritizing reaches in Chicken Creek** ~ Sub Committee has selected process for assessing survey data and maps and ranking watershed reaches in Chicken Creek ~ Coordinator summarizes assessment and ranking process and produces final map identifying conservation and restoration priorities for Chicken Creek
Rock Creek: Compile and Review data and Develop Criteria ~ Coordinator compiles and presents data and watershed map to Sub Committee for review and comment. (July mtg.) ~ Sub Committee develops conservation and restoration criteria to analyze and rank each reach for priority (September mtg.) ~ Weight data points for each reach according to agreed upon criteria and ranking (September mtg.)								√	√	√				**Assessment protocol and Criteria for prioritizing reaches in Rock Creek** ~ Sub Committee has selected process for assessing survey data and maps and ranking watershed reaches in Rock Creek ~ Coordinator summarizes assessment and ranking process and produces final map identifying conservation and restoration priorities for Rock Creek

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Develop Conservation and Restoration Strategies ~ Sub-Committee develops strategies to protect reaches and/or sites that have been identified for conservation for all three watersheds. (Early October mtg.) ~ Sub Committee develops strategies to restore reaches and/or sites that have been identified for restoration for all three watersheds. (Early October mtg.)										√	√			**Conservation and Restoration Strategies** ~ Strategies for all three watersheds ~ Identify partners, funding sources, timeline ~ Next steps for implementation
Assemble and Draft Conservation and Restoration Plan ~ Coordinator finishes assembling Draft Plan (November) o Summarize data collection, data sources, methodologies and criteria used for each sub-watershed. o Produce and include final maps identifying priority reaches for conservation and restoration o Outline conservation and restoration strategies ~ Send Draft to Sub-committee members the first week of November to review and comment at meeting scheduled for last week of November											√	√		**Draft Plan ready for comment** ~ Maps for each of the three watersheds identifying priority reaches for conservation and restoration ~ Summary of methodologies, data sources, data collection process and criteria for each of the watersheds ~ Strategies identifying partners, funding sources, timelines, outcomes and/or target audience

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Committee Review of Draft Assessment ~ Sub-committee provides feedback regarding assembly, format, content, data collection and analysis. (Late November mtg.) ~ Sub-committee discusses procedure for presenting Draft Assessment to the public? Does timeline and budget allow opportunity to organize a public meeting? Could we piggyback on already scheduled events and meetings? ~ Sub-Committee brainstorms "next steps" for Plan implementation													√	**Committee Feedback on Draft Plan** ~ Record and incorporate Sub-committee members' comments and recommendations into Draft Plan ~ Outline of potential "Next Steps" for implementing Plan ~ Strategy for presenting Conservation and Restoration Plan to the Public and R2R partners
Present Second Draft Assessment to Sub-Committee ~ Coordinator submits revised Plan to Sub-Committee members by the end of December ~ Sub-Committee provides feedback on revised Plan via email and telephone calls ~ Coordinator incorporates final changes and sends second Draft Plan to full Committee for consideration. (January 2003)													√	**Strategies for Action Plan Finalized** ~ Incorporate Committee's recommendations on second Draft ~ R2R Committee reviews and comments on final Plan ~ R2R Committee discusses comments at January 2003 meeting.

TASKS	MONTH													OUTCOME
	1	2	3	4	5	6	7	8	9	10	11	12	1	
Identify Next Steps on Work Plan: ~ Sub-committee makes decision regarding implementation of Conservation and Restoration Plan and Work Plan for 2003. (Dec mtg.) ~ Finalize plans for presenting Plan to the Public and R2R partners													√	**Next Steps Identified**
Wrap up program and identify next steps ~ Coordinator presents and submits final report to Committee (January 2003)													√	**Coordinator's Final report** ~ Describe the process, project, outcomes and outline next steps for R2R
Identify projects and opportunities for assistance & involve students, partners and community volunteers **Identify opportunities for community outreach to raise awareness about R2R vision, goals and programs**	√	√	√	√	√	√	√	√	√	√	√			**Informed and involved community assets**

Participants

R2R Advisory Committee

Member	Affiliation	Resident
Tom Aufenthie	Sherwood Community Volunteer (Retired Forester)	X
Carl Axelsen	Millers Landing Resident Friends of the Refuge	X
Janet Bechtold	TAG Program, Sherwood School District	X
Kay Blouke	Sherwood Community Woodhaven Resident	X
Sunny Boyer	Sherwood YMCA	
Margot Fervia-Neamtzu	Vineyards Resident Tualatin Riverkeepers	X
Ron Garst	Tualatin Riverkeepers Tualatin River Watershed Council (Retired Fisheries Biologist)	X
~~Ron Carley~~ Mike Houck	Urban Conservationist Audubon Society of Portland	
Ken Huffer	Natural Resource Specialist City of Sherwood	
Chris Lapp	USFWS, Deputy Refuge Mgr. Tualatin River Natl. Wildlife Refuge	X
Mike Marxen	USFWS-Pacific NW Wildlife Refuge Brittany Place Resident	X
Keith Mays	City of Sherwood City Council President	X
Kelly Neumeier	Sherwood Community Oregon Trail Resident	X
Colleen Reed	Institute of Sustainability City of Sherwood	
Jennifer Thompson	USFWS Greenspaces Program Grantor	
Chris Neamtzu	Vineyards Resident Parks Board Representative	X
Christine Egan	*R2R Coordinator*	
Julia Crown	*Assistant R2R Coordinator*	

R2R Sub Committee Roster

Sub Committee	Member	Affiliation
YOUTH EDUCATION		
	Janet Bechtold	TAG Program, Sherwood School District Sherwood Resident
	Carl Axelsen	Friends of the Refuge Sherwood Resident
	Colleen Reed	Sherwood Institute of Sustainability
	Kirsten Hagen	Newberg Earth Force Sherwood Resident
	Aaron Paulson	Y Earth Service Corps Coordinator Sherwood YMCA
	Cara Slaton	Earth Force, Portland State University
HOMEOWNER EDUCATION/OUTREACH		
	Margot Fervia-Neamtzu	Tualatin Riverkeepers Vineyards Resident
	Mike Marxen	USFWS-Pacific NW Wildlife Refuge Sherwood Resident
	Kay Blouke	Sherwood Resident
	Peggy Buytaert	Sherwood Resident
	Kelly Neumeier	Sherwood Resident
	Julie Reeder	Sherwood Resident
	Alejandro Chavez	Sherwood Resident
CONSERVATION RESTORATION		
	Tom Aufenthie	Sherwood Resident
	Chris Lapp /	USFWS Tualatin River Natl. Wildlife Refuge
	Ron Garst	Tualatin Riverkeepers Tualatin River Watershed Council, Watershed Resident
	Jennifer Thompson	USFWS, Greenspaces Program
	Ken Huffer	Natural Resource Specialist City of Sherwood
	Jim Closson	Three Rivers Land Conservancy
	Jill Ory	Clean Water Services Healthy Streams Plan
	Pete Schmidt	USFWS Tualatin River Natl. Wildlife Refuge, Watershed Resident

Project Area

Raindrops to Refuge works within the Rock Creek, Cedar Creek, and Chicken Creek Watersheds, which are located in the southwestern portion of the Lower Tualatin River Watershed. These three watersheds total approximately 23 square miles and of this total approximately 20% is within Sherwood's Urban Growth Boundary, 4% is within the boundaries of the Tualatin River National Wildlife Refuge, and the remaining area is comprised of farmland and undeveloped wetlands and forested areas. All three streams are identified as being 303d "Water Quality Limited", by the Oregon Department of Environmental Quality, for exceeding the Total Maximum Daily Loads (TMDLs) established for temperature, dissolved oxygen, and bacteria.

Cedar Creek Watershed

Cedar Creek is the largest of the three watersheds (5792 acres) and has experienced the most urban development around its mainstem and tributaries. Cedar Creek begins where Parret Mountain and the Chehalem Mountains meet and flows northward through the City of Sherwood until its confluence with Chicken Creek. Cedar Creek is being affected by a number of issues, including nonnative species, degraded wetland and riparian plant communities, erosion, litter, excessive storm water runoff, pollution from overland runoff, logging, and encroaching development.

Chicken Creek Watershed

Chicken Creek is a tributary to the Tualatin River and its watershed is the next largest of the three watersheds, comprising approximately 4836 acres. Of the three watersheds, the Chicken Creek watershed has experienced the least amount of development activities; instead the lands within this watershed are primarily used for agricultural purposes or have remained in a natural state. Chicken Creek is significant because it is the primary source for some of the Tualatin River National Wildlife Refuge's most productive wetlands and Winter steelhead trout are considered by ODFW to spawn and rear in Chicken creek (ODFW 1999).

Rock Creek Watershed

Rock Creek is located adjacent to and east of the Cedar Creek Watershed. The Rock Creek Watershed is the smallest of the three watersheds within R2R's project area, at 3994 acres, and is a tributary to the Tualatin River. Most of the uplands and floodplain areas around the downstream portions of Rock Creek are used for agricultural purposes. Residential and industrial development has occurred along its uplands as it flows through Sherwood's UGB, but little to no development has occurred within its 100-year floodplain. Before entering into Sherwood's UGB, Rock Creek passes through what has been identified as the Tonquin Geological Area. The lands around the upstream portions and headwater areas of the watershed are primarily used for agricultural purposes and residential development. Over the years, Rock Creek has been significantly impacted and altered due to issues related to: nonnative invasive species, loss of or degraded wetland and riparian plant communities, encroaching development, pollution from overland runoff and direct human disturbance.

City of Sherwood

Sherwood is located in Washington County and southwest of the Portland Metro Area. Since 1989 Sherwood has been one the fastest growing cities in Oregon (population 2,500 in 1989 to 12,847 in 2001). During this period of expansive growth the City has

made open space preservation a top priority and as a result Sherwood is noted as having one the highest rates of open space per capita, within Oregon. Currently the City manages 300 acres of open space including: parks, sports facilities, and tracts of open space to remain undeveloped, as passive open space, including most of the 100-year flood plain along Cedar Creek, as well as portions along Rock Creek. These floodplain and open space areas were dedicated to the City to preserve open space, wetlands, and riparian corridors for the benefit of wildlife habitat, clean water, passive and active recreational opportunities, and educational areas for the community's youth, and for their esthetic value.

Many of these tracts open space areas had already been significantly altered, due to prior uses (agricultural, residential, storage) or impacted by invasive vegetation, poor water quality, vandalism, erosion, and native vegetation loss, prior to dedication or purchase and as the City of Sherwood has acquired these properties, development has occurred around these properties thus further contributing to their degradation. As a result, the creation of management strategies, to effectively begin restoration and enhancement activities to return these areas to a natural state and restore ecosystem function, has become a priority.

Tualatin River National Wildlife Refuge

The creation of the Tualatin River National Wildlife Refuge began in 1992, led by local residents, the City of Sherwood, the US Fish and Wildlife Service, and many other regional partners. The US Fish and Wildlife Service has acquired 1,253 acres of the proposed 3058 acres and approximately 574 acres are within Raindrops to Refuge's project area. The Tualatin River National Wildlife Refuge is one of twelve "Urban Refuges" in the United States and was created to conserve, restore, and manage important habitat areas and flyways for the benefit of fish and wildlife, including up to 50,000 migratory waterfowl. Over the years, the Refuge has been significantly impacted by the rapid growth of the surrounding urban areas and agricultural practices. Issues such as excessive stormwater runoff, poor water quality, loss of upland native plant communities, the spread of nonnative invasives, and human disturbance, have all interfered with the Refuge's restoration and management activities.

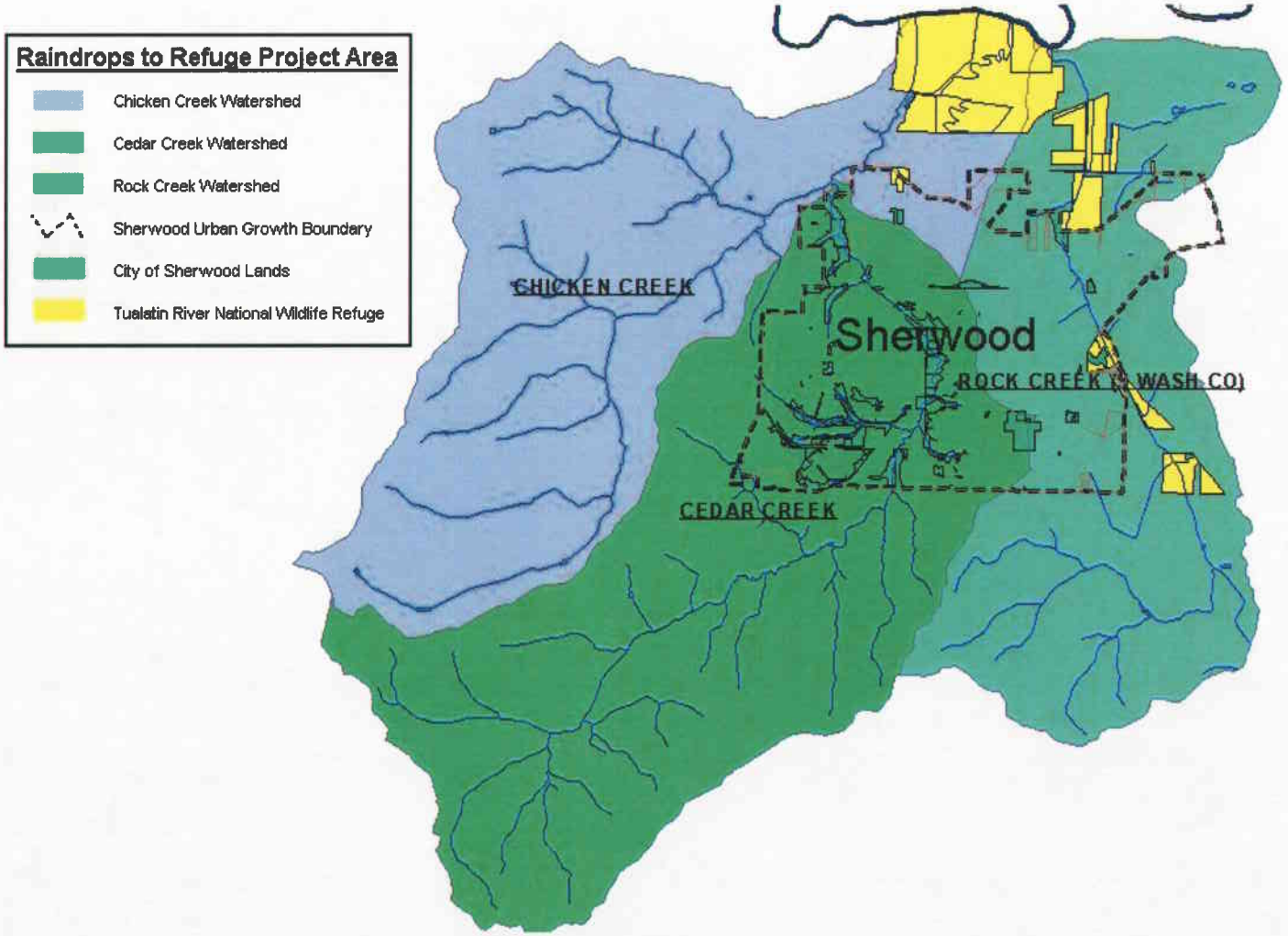

Figure 1: R2R Project Area Map

Methodology Used

The intent of this project was to compile existing data and use this information to draft an R2R Action Plan to direct restoration, conservation, education, and outreach activities for Sherwood's three watersheds. R2R's primary sources for information included: Metro's *Goal 5* and *Regional Greenspaces* programs; The Oregon Department of Fish and Wildlife's *Distribution of Fish and Crayfish and Measurement of Available Habitat in the Tualatin Basin*; Clean Water Services' *Watersheds 2000: Healthy Streams Plan*; and The Tualatin River Watershed Council's *Lower Tualatin Watershed Assessment* The following is a summary of each of the programs' methodologies:

Metro Goal 5

Methodology: Metro used a map modeling and scoring system using two foot contour aerial photographs (2001) to rate landscape features according to their contribution to wildlife habitat and riparian function. To comply with state land use laws for Goal 5, Metro was required to assess and score "wildlife habitat values" and "riparian functions" individually.

Produced by: Metro Regional Services, Growth Management Department

Contact/Author: Lori Hennings, Metro Growth Management, Planner; Paul Ketcham, Metro Growth Management, Planning Director; Justin Houk, Metro Growth Management, GIS Analyst

Purpose: The purpose of this map is to identify regionally significant wildlife habitat and riparian corridors to inform Metro's Fish and Wildlife Program for Goal 5. Provides a holistic view of watershed function emphasizing the interconnectedness of the system, including the relationship of riparian corridors with upland habitats and connectivity. Maps the comparative value for riparian and upland wildlife in the Metro region.

Wildlife Habitat Model: Metro's Goal 5 Science Technical Report identified the following characteristics to be important to the value of habitat to wildlife (see matrices below for details about each characteristic)

- Larger habitat patches are better than small patches
- Interior habitat is likely to protect more at-risk species than edge habitat
- Connectivity and/or proximity to water is valuable
- Connectivity to other patches is important
- Small patches of unique habitat are worth saving (the idea is to use best available professional knowledge to identify and add select patches back in after the modeling process is completed)

Based on these findings, Metro formulated a GIS model to rank the value of natural areas to wildlife in the region. Wildlife value was derived by evaluating patches of resource features using five sub-criteria. The sub criteria scores were standardized and added together to create a final model score. This score ranges from 1 (lowest) to 9 (highest). Sub criteria listed below:

1. Patch size
   i. +2 acres in size
2. Proximity and connectivity to other patches

LARGE PATCHES ARE BETTER THAN SMALL PATCHES		
How does the function benefit fish and wildlife?	**Mapping assumption**	**Criteria and Ranking**
Several studies have been conducted that indicate a larger habitat patch is better for the survival of many native species. • A study on the predation on neotropical migratory songbirds in the northeastern U.S. found an increased amount of predation in smaller forest patches. • A study of native small mammal populations found that species diversity increased with patch size. The habitat patches that did not contain native small mammals were in general smaller fragments. • Local studies show that large habitat patches have higher proportions of native plants and birds than small patches. Larger patches frequently retain more of the functions and values provided by native habitat. For example, many forest interior bird species are dependent on insects for food and a study in Ontario found that invertebrate biomass was 10 to 36 times higher in large forest patches than small forest patches. Long-term trends in wildlife populations are directly related to the area of habitat available – the larger the patch, the longer a population can sustain itself. Some species require a certain amount of territory for foraging and breeding purposes. Other species are limited in population by the amount of resources available within a patch, thus the larger the patch the larger the population. Larger animals typically require a larger amount of land just to support their body mass. For example, a deer forages on a much larger range than a mouse.	**Overall Patch Size** Assumption: the larger the patch the greater the value for wildlife habitat.	The rank value for a patch is calculated by: 1. A "patch" is defined as any forest patch, forested wetland, or non-forested wetland with a total size greater than 2 acres. Wetlands adjacent to forests are considered part of the patch, whereas non-forested wetlands form their own patch. 2. Place patches into an ascending array based on their calculated size in acres. After all patches in the model have been assigned scores for each criterion, calibrate individual criterion scores such that all criteria have the same point scale. Now each patch will have a cumulative score, and patches can be divided into three habitat quality tiers based on cumulative model scores, with guidance from field data.

MAXIMIZE INTERIOR HABITAT (MINIMIZE EDGE HABITAT)		
How does the function benefit fish and wildlife?	**Mapping assumption**	**Criteria and Ranking**
Edge habitat occurs where one habitat type, such as a forest, meets a meadow, stream, road, or other natural or artificial habitat type. While edge habitats frequently contain a high number of species, many sensitive species that need interior habitat are unable to survive in edge areas. • The size of a patch, as well as the relationship with surrounding habitats, relate directly to the edge effects on wildlife populations. • Species richness and diversity is typically higher in edge habitats, but the number of habitat specialists, or species that require a particular type of habitat for survival, tends to decrease. These are the species most vulnerable to negative effects of urbanization. • Patch size and shape both impact the amount of edge habitat – a large square has less edge habitat and more interior habitat than a long, thinly shaped habitat. • Urbanization typically increases habitat fragmentation, providing more edge habitat and reducing the amount of original habitat. The edge effect can penetrate far into the interior habitat necessary for certain species. • Some studies have shown that certain impacts such as invasion by exotic plants and predation can penetrate up to 1,640 feet (500 meters) into the forest. • Studies have found that the abundance of interior habitat bird species was reduced within 656-1,640 feet (200 to 500 meters) of an edge. • Local studies have found that non-native plants and birds are substantially reduced beyond 200 feet (61 meters) of an edge. • A study in southern Ontario found that ovenbirds, an interior habitat species, select nest sites more than 820 feet (250 meters) from the forest edge, a distance that is not possible in a small habitat fragment. *(See the Upland Habitat section of Metro's Scientific Literature Review for Goal 5).*	**Edge to Interior** Assumption: a patch with more interior habitat has a higher value for wildlife habitat because it reduces competition from nonnative and generalist species, provides better food and cover, and increases avian nest success for native species.	The rank value for a patch is calculated by: 1. Place patches into an ascending array based on their calculated interior size in acres. "Interior" is calculated by drawing internal 200-foot buffers within each patch and calculating the acreage of the new interior patch. 2. After all patches in the model have been assigned scores for each criterion, calibrate individual criterion scores such that all criteria have the same point scale. Now each patch will have a cumulative score, and patches can be divided into three habitat quality tiers based on cumulative model scores, with guidance from field data.
CONNECTIVITY AND PROXIMITY TO WATER RESOURCES IS IMPORTANT		
How does the function benefit fish and wildlife?	**Mapping assumption**	**Criteria and Ranking**

Corridors play an important role in urban areas to provide opportunity for migration and movement, including between upland and riparian habitats. • Habitat patches near water resources have increased diversity of wildlife • Most wildlife species use riparian areas for some aspect of their life history • In the Metro region, nearly half of all native vertebrate species depend on riparian habitats, with 93 percent using riparian areas for breeding or feeding • Riparian corridors frequently serve as travel routes, especially in urban areas, and have the greatest potential for an interconnected wildlife system providing food, water and travel routes	**Proximity to water** Assumption: patches that are closer to sources of water have higher wildlife performance than areas further from water sources. Upland patches with connectivity to the riparian area are more valuable than disconnected upland patches.	The rank value for a patch is calculated by: 1. Determining the average distance of a patch from water sources such as streams, lakes and wetlands within 320 feet of the patch. Patches receive a proximity score based on how close the patch is to the water resource. 2. Placing patches into a descending array based on the average distance to water sources. 3. After all patches in the model have been assigned scores for each criterion, calibrate individual criterion scores such that all criteria have the same point scale. Now each patch will have a cumulative score, and patches can be divided into three habitat quality tiers based on cumulative model scores, with guidance from field data.
CONNECTIVITY AND PROXIMITY TO OTHER PATCHES IS IMPORTANT		
How does the function benefit fish and wildlife?	**Mapping assumption**	**Criteria and Ranking**
Connectivity is important for wildlife for several reasons. Wildlife populations that are connected to each other are more likely to survive over the long term than an isolated. Many species must migrate seasonally to meet basic needs for food, shelter and breeding, and connections between habitat patches allow this migration to occur. Animal movement frequency decreases in direct relation to the distance between habitat patches, and is called the *distance effect*. • Increased habitat fragmentation impacts the ability of wildlife to disperse between habitat patches. • Dispersal of animals between patches helps to preserve populations by protecting against catastrophes and preventing genetic decline due to inbreeding. • However, the distance between habitat fragments need not be great before it begins to have an impact if a species is unable to move through the matrix of modified habitat. • Some species may be able to use small habitat patches that are individually too small by composing a home range made up of multiple habitat fragments. • Other species may survive within the urban matrix if they have a series of relatively small patches that are connected by movement corridors.	**Proximity to other Patches** Assumption: the closer a patch is to other disaggregated patches the greater the value for wildlife habitat.	The score for a patch is calculated as follows: 1. Perform a nearest neighbor operation that measures the average distance from each patch to other patches within ¼ mile of their perimeters.* 2. Place patches into a descending array based on the average distance to other patches. 3. After all patches in the model have been assigned scores for each criterion, calibrate individual criterion scores such that all criteria have the same point scale. Now each patch will have a cumulative score, and patches can be divided into three habitat quality tiers based on cumulative model scores, with guidance from field data. *General fragmentation also affects the overall score to a lesser degree.

Riparian Model: Riparian corridors were defined based on five functions:

1. Microclimate and shade
2. Stream flow moderation and storage
3. Bank stabilization, sediment and pollution control
4. Large wood and channel dynamics
5. Organic material sources

Metro devised a scoring system to rate the landscape features according to their contribution to riparian function. Based on distances recommended in the scientific literature, landscape features were considered either primary or secondary for ecological function. For example, trees and other woody vegetation contributing to riparian function within the first 100 feet are considered primary features and given six points. Trees and other woody vegetation beyond 100 feet and up to 780 feet are considered secondary features and assigned one point.

In February 2001, maps displaying the location of resource features such as flood areas, lakes, wetlands, streams, steep ravines, and forest canopy were made available to local governments and the general public. Metro requested information to improve the accuracy of the features represented on the maps. Metro received and reviewed numerous map corrections from local jurisdictions, property owners and other interested parties. Metro staff applied a consistent set of map change protocols to these requests. Metro is continuing to accept map change requests and is making every attempt to see that Goal 5 maps are as accurate and complete as possible.

Ecological function	Criteria for receiving a primary score	Criteria for receiving a secondary score
Microclimate and shade	Forest or woody vegetation within **100 feet** of a stream; a wetland[1]; or a flood area[2].	Forest or woody vegetation that is contiguous to the primary area (which is 100 feet) and extends outward to **780** feet.
Stream flow moderation and water storage	A wetland or other water body[3] with a hydrologic connection to a stream; or a flood area.	Forest, woody vegetation, or low structure vegetation/undeveloped soils within **300 feet**[4] of a stream; or forest that is contiguous to the riparian corridor (starts within **300 feet**[5] but extends beyond); or developed floodplains.
Bank stabilization, sediment and pollution control	A 50-foot band is included within the riparian corridor as a default to maintain basic functions. All sites within **50 feet** of a surface stream receive a primary score. Forest, woody vegetation, or low structure vegetation/undeveloped soils within **100 feet**[6] of a stream or a wetland; or forest, woody vegetation, or low structure vegetation/ undeveloped soils[8] within a flood area. Forest, woody vegetation, or low structure vegetation/undeveloped soils within **100-200 feet** of a stream if the slope is greater than 25%.	Forest, woody vegetation, or low structure vegetation/undeveloped soils located on a slope greater than 25%, that starts within **175** feet[7] of a stream and runs to the first effective break in slope.
Large wood and channel dynamics	Forest within **150 feet** of a stream or wetland; or within a flood area. The channel migration zone is basically defined by the floodplain, but where there is no mapped floodplain a default of **50 feet** was selected to allow for the channel migration zone[9].	Forest within **150 to 262 feet** of a stream; or developed floodplains.
Organic material sources	Forest or woody vegetation within **100 feet** of a stream or wetland; or within a flood area.	Forest or woody vegetation within **100 to 170 feet** of a stream.

Geographical Scope: The Goal 5 study area includes all of the lands inside Metro's service area boundary. Does not follow watershed boundaries that fall outside Metro's service area.

Data Format: Goal 5 maps show areas identified as providing significant riparian function and wildlife habitat. Accompanying Technical Report by Lori Hennings, Metro Planner provides addition background regarding scientific literature and references.

Draft Regional Greenspaces System 2002 - Now adopted "conceptual" Regional Greensp. system map.

Methodology: Metro used 30 meter Landsat satellite imagery (1998) to interpret forest canopy, land cover, natural areas and greenspaces to model "most important natural areas and greenspaces" in the Portland metropolitan area.

Produced by: Metro Regional Services, Growth Management Department

Contact/Author: Jennifer Budhabhatti, Senior Planner, Metro Regional Parks and Greenspaces; Joe Price, GIS Analyst, Metro Regional Parks and Greenspaces

Purpose: To identify "Greenspaces with Highest Ecological Function" and develop a vision for the Greenspaces System in the metropolitan area. Show how animals and people move through greenspaces system, i.e. riparian corridors and nodes. Areas identified as having the highest ecological function would be targeted by Metro for acquisition and conservation easements.

Type of Assessment: The most important natural areas and greenspaces were identified though GTAC modeling efforts using the base map interpretation of satellite imagery for forest canopy, land cover and natural areas and greenspaces. The following four criteria were used to identify lands with the highest ecological function:

1. Size of Path: Patch had to be bigger than two acres and include areas with identified canopy or vegetation. Satellite imagery may not have been able to determine whether a patch was a pine forest or blackberry patch. Identified patches do not follow tax lot boundaries.
2. Proximity to other Natural Areas and Patches: Natural areas identified already in protective status, i.e. Hagg Lake, East Buttes and Forest Park.
3. Proximity to water: Lakes, creeks, wetlands, etc.
4. Species Richness: interpreted vegetative cover and used "pixel ranking" to interpret land cover. Working with Oregon Natural Heritage Program to refine land cover classification system – TBA.

Ecological corridors as defined by Greenspaces Technical Advisory Committee (GTAC) in 2001.

Geographical Scope: Follows watershed boundaries, not confined to Metro Service Area. Not subject to current events, protected or projected conservation areas or local politics.

Data Format: GIS map showing ecological and highest ecologically significant areas and corridors to be conserved.

Distribution of Fish and Crayfish, and Measurement of Available Habitat in the Tualatin Basin

Methodology: Index of Biotic Integrity

Produced in December 2001 by: Oregon Department of Fish and Wildlife

Contact/Author: Kevin A. Leader, Columbia River Investigations Program

Purpose: Conducted fish, habitat, and water quality surveys in sixteen tributaries of the Lower Tualatin River as part of an effort to assess the biotic health of the watershed.

The report grouped stream reaches (upper, middle and lower) into three major categories to help prioritize stream restoration efforts that could be carried out in sub-basin plans. Habitat improvements, such as increases in the amount of instream cover (trees and vegetation to increase canopy cover, undercut banks, rocks, woody debris or increased depth or turbulence), were recommended to increase the number of native intolerant species such as cutthroat trout.

Type of Assessment: Biotic integrity scores were used to evaluate the need for restoration and enhancement within Tualatin tributaries. Survey found little change IBI scores among stream reaches when compared with the previous ODFW Tualatin tributary

surveys. Of 154 biotic integrity scores calculated, none were considered acceptable, fifteen were marginally impaired, and the remaining scores were considered severely impaired. Habitat measurements changed little from previous survey. Glides were the most common habitat type, and soil was the most common substrate. Little woody debris was found in any stream.

Fish Surveys: To estimate relative abundance of fish in each stream reach, survey team used a three-pass removal method. A 100m section of each stream reach was selected based on accessibility, landowner approval, and how well the section represented the entire reach. A backpack electrofishing unit was used to conduct the surveys. Survey team made three successive passes starting at the downstream end of the stream section and working upstream. During each pass fish were netted and held in a holding tank until the completion of the pass. Fish sampling was conducted once in each stream reach during summer, fall, winter and spring. Fish were identified to species, examined for anomalies and released.

Habitat Surveys: Surveyed three reaches of each stream, except Rock and Cedar creeks where only two reaches were surveyed. Reaches were selected to represent lower, middle and upper sections of each stream. Reach lengths determined by accessibility and landowner permission.

For each reach, survey team described general physical habitat characteristics such as channel and valley form, vegetation class, land use, water temperature, and stream flow. Each reach was further divided into habitat units such as pool, riffle and glide. Team also noted habitat features such as beaver activity, culverts, and possible fish passage barriers.

Every habitat unit was given a woody debris rating depending on wood composition as it related to fish habitat. A rating of one to five was given, with one being little or no wood, and five being large amounts of wood creating cover and refuge.

Water Quality: With each reach, team selected a site with representative characteristics of the entire reach and collected a set of water quality measurements. Water quality measurements were taken once each season concurrent with fish surveys. Measurements taken were pH, turbidity, dissolved oxygen, temperature, water velocity, conductivity, salinity, and total dissolved solids.

Index of Biotic Integrity (IBI): The IBI is a numerical score calculated from field survey data (see survey collection methodologies above) to assess fish assemblages at sampling sites within the basin. The IBI consist of measureables that reflect structural and functional characteristics of fish communities. Ten measureables were used to assign IBI scores. These included:

1. number of native species,
2. number of native benthic species,
3. number of native pelagic species,
4. number of intolerant species,
5. number of individuals,
6. percent tolerant individuals,
7. percent top carnivores,
8. percent native insectivores other than cottids,
9. percent introduced, and

10. Percent with anomalies.

Scores were assigned to each of these measureables (a 1, 3 or 5). Because no historic information was available for fish assemblages in the Tualatin Basin and because all streams surveyed had experienced some form of alteration, it was impossible to estimate expected IBI scores for "excellent" fish assemblages similar to those undisturbed by humans. Scoring criteria were categorized in a range of observed scores as follows: 0-19 = very poor; 20-29 = poor; 30-39 = fair; 40-45 = good; 46-50 = excellent. Where multiple reaches were sampled on a stream, IBI values were averaged and, if the IBI average was in the poor or very poor category, the stream was listed as water quality limited.

Geographical Scope: Surveyed lower, middle and upper reaches of most of the sixteen streams. Cedar, Rock and Chicken creeks were among those streams surveyed:

* Cedar – only middle and upper
* Chicken – only middle and upper
* Rock – only middle and upper

Habitat surveys were conducted during the summers of 1999 and 2000, whereas fish and water quality surveys were conducted in summer, fall, winter and spring, 1999-2001. This project is a follow up to similar work conducted by the Oregon Department of Fish and Wildlife from 1993-95.

Data Format: A 67-page report detailing methodologies, geographic area, survey results and recommendations.

Watersheds 2000: Healthy Streams Plan

Methodology: Rapid Stream Assessment Technique

Produced in 2002 by: Clean Water Services (formerly United Sewerage Agency)

Contact/Author: Kendra Smith, CWS; Jill Ory, CWS

Purpose: Watersheds 2000 is the inventory portion of larger planning effort called the Healthy Streams Plan, which began in October 1999 after winter steelhead and spring Chinook were listed as threatened species under the Endangered Species Act (ESA). The Healthy Streams Plan is a comprehensive, watershed-based plan that integrates the requirements of the ESA and the Clean Water Act in a way that promotes overall stream health. Using the inventory information from Watersheds 2000, the plan will identify and prioritize specific projects, policies, and program changes needed to further improve water quality, manage flooding and floodplains, and help recover aquatic species in the Tualatin River Basin.

Type of Assessment: Team of scientists surveyed over 470 miles of streams within the Tualatin River Basin, with 200 foot riparian buffers on either side of the stream. They used the Rapid Stream Assessment Technique (RSAT) to collect and assess data. Most reaches were 500 ft to half mile of stream length, usually delineated by landscape transitions, ownership patterns or manmade structures, i.e. roads or culverts. Survey included Cedar, Rock and Chicken creeks, with the exception of upper Chicken Creek, which flows through the Tualatin River National Wildlife Refuge.

Data collected included: aquatic species habitat, floodplain conditions, fish and crayfish distribution, streamside vegetation conditions, stream flow and location, and stormwater outfall locations and conditions.

After collecting the data and assessing riparian functions, the survey team also proposed solutions to address limiting factors identified for specific reaches. Clean Water Services used this data and proposed solutions to prioritize different reaches for restoration or conservation. The ranking was from 1 to 5, with five being the highest priority.

Geographical Scope: Tualatin River Basin, 712 square miles, of which Sherwood's watersheds cover 22.7 square miles.

Data Format: Survey data and GIS maps will be posted on a web site hosted by Clean Water Services. CWS provided R2R with data spreadsheets that included field notes, limiting factors, proposed solutions, and project rankings.

Lower Tualatin Watershed Assessment

Methodology: Ecosystem analysis at the watershed scale: a federal guide for watershed analysis (REO 1995). Watershed analysis methodology is built up of six complementary parts:

1. Watershed Characterization: defining the characteristics that distinguish the watershed
2. Core Topics and Key Questions: regarding watershed processes and their specific interactions with management activities.
3. Current Conditions within the Watershed
4. Reference Conditions: reconstructs watershed processes and conditions, usually prior to European settlement.
5. Synthesis: synthesize the changes in watershed process that have been caused by various management activities.
6. Recommendations: for current management and restoration

Within the general framework of the federal methodology, several techniques of the 1999 OWEB methodology were incorporated to help ensure consistency with past watershed analyses in the Tualatin sub basin.

Produced on August 14, 2001 by: Washington County Soil and Water Conservation District; Tualatin River Watershed Council

Contact/Author: John Hawksworth, Principal Author – WA SWCD

Purpose: To guide the Tualatin River Watershed Council in its management and planning efforts for the Lower Tualatin Basin. Assessment addresses issues at the watershed level and takes the interconnected nature of watershed processes into account.

Type of Assessment: Analysis relies heavily upon data collected by other agencies and private sources. It has relied extensively upon GIS analysis of publicly available data contained in the Tualatin River Watershed Information System, produced by Ecotrust in 1998. However, the analysis is not intended to replace field-based data for site-specific decisions. No intensive review was performed on any data used in this assessment. There may be flaws in the source data and/or analysis performed. Report should only be used for general guidelines to point the direction to more site-specific studies.

Geographical Scope: The Lower Tualatin watershed includes 13 sub basins covering 97 square miles (62,300 acres) in the southeastern part of the Tualatin River Watershed.

Data Format: A 140-page report entitled, "Lower Tualatin Watershed Analysis. Report includes GIS color maps, graphs, reference sources, recommendations and general demographics about Rock, Cedar and Chicken Creeks.

On-going Tasks

The initial draft of the R2R Action Plan will be completed by the end of April 2003. Upon completion of the initial draft, R2R will send the Action Plan out to a list of reviewers from outside agencies and organizations to solicit feedback and recommendations to be incorporated into the plan. Then in the spring of 2003, public input will be solicited via a community workshop and at the R2R website. During this time period and throughout the rest of the year, work will continue collaborating with R2R partners to refine strategies, confirm w/partners, identify funding sources, develop timelines, site plans and treatment options, and create templates for outreach and education. To support the upcoming work, R2R has secured support from the National Fish and Wildlife Foundation to maintain the coordinator's position. Support from the Centennial Refuge Legacy Grant will allow R2R to implement the first three focus areas of its Action Plan for the benefit of Sherwood watersheds and the Tualatin River National Wildlife Refuge.

> **Focus Area 1**: **Action Plan** Work w/Partners to Develop and Implement Action Plan's Recommendations. & Strategies
>
> **Focus Area 2**: Solicit and Incorporate Public Feedback for Action Plan
>
> **Focus Area 3**: **Homeowner Stewardship** Increase Stewardship and Awareness among Sherwood Homeowners

During finalization and implementation of the Action Plan, work will continue in further developing and building sustainability for R2R and its programs.

Expenditure Summary

Greenspaces Grant Expenditure Summary

Breakdown in Costs	Itemized Costs	Approved Greenspaces Amount	Expenditures as of 1/2/03	Remaining Funds
Staff				
	R2R Coordinator (salary, benefits)	**$38,410.27**	**$38,410.27**	**$0.00**
Supplies/Materials				
Office Incidentals	Materials for R2R members	$12.00	$12.00	$0.00
	Postage, FedEx	$29.73	$29.73	$0.00
	Business Cards: Asst. Program Coord. and new Program Coord.	$40.00	$40.00	$0.00
	Maps for Display and Planning, lamination	$165.00	$165.00	$0.00
Outreach Costs	Display Board w/Dry Erase Board	$330.00	$330.00	$0.00
	Prepare photos, text and graphics for Display Board	$65.00	$65.00	$0.00
	Materials for Homeowner Education Workshops	$20.00	$20.00	$0.00
	Volunteer Recognition	$21.00	$21.00	$0.00
Copies/Printing	Print Color R2R Brochures	$640.00	$640.00	$0.00
	Copies - Misc. (inserts, flyers)	$10.00	$10.00	$0.00
	Print Cons/Rest Action Plan. - 20 copies, color, bindings	$160.00	$160.00	$0.00
Trainings/Workshops	Watershed Stewardship Enhancement Program, OSU Ext.	$52.00	$52.00	$0.00
	Cybertracking Workshop	$35.00	$35.00	$0.00
Conferences/Events	Tualatin Basin Winter Conference	$10.00	$10.00	$0.00
Totals		**$1,589.73**	**$1,589.73**	**$0.00**
Grand Total		**$40,000.00**	**$40,000.00**	**$0.00**

Project Totals

Greenspaces Grant	**$40,000**
Matching Contributions *(please refer to Attachments 1 and 2 for detailed description of matching contributions)*	**$43,979**[1]
Total Cost for Project	**$83,979**

[1] FYI: R2R also received an additional $48,000 in funding and in kind service towards this project, but this amount is not provided in the above table, as these funds are federal in origin.

Summary and Conclusions

At the start of the project, Raindrops to Refuge selected and hired Christine Egan to serve as the group's coordinator and the Action Plan development manager. After starting in January 2003, Christine met with each of Raindrops to Refuge participants to learn more about their ideas, concerns, and backgrounds, to begin to address any capacity issues and to put together a work plan to meet R2R's goals and objectives for the year. Upon completing this interview process, work began to organize the group into four working subcommittees (based on four focus areas: Conservation/Restoration, Youth Education, Public Education and Outreach, and R2R Capacity Building) and then started recruiting additional participants for each of these subcommittees to address specific needs.

Action Plan

As the recruiting and organizational process continued, meetings were held with a variety of local organizations and agencies to identify, gather, and review all existing data and plans for Sherwood's three watersheds, as well as several watershed action plans from other organizations throughout the region to select a format for R2R's Action Plan. This work carried out by Christine and the Conservation/Restoration Subcommittee, continued throughout the first three months of the project, with the primary information sources being Clean Water Services' Watersheds 2000, Metro's Goal 5 and Greenspaces programs, the Washington County Soil and Water Conservation District's Lower Tualatin River Watershed Assessment, and ODFW's Distribution of Fish and Crayfish, and Measurement of Available Habitat in the Tualatin River Basin.

During this collection and review process, the Subcommittee began what became the most difficult part of the process of identifying what data, methodologies and criteria will be utilized and/or combined for determining priorities both geographically and by issue. At first, the group wanted to prioritize by stream reach and identify specific projects to address issues affecting each stream reach, but it was soon realized that this process would be extremely difficult, due to time constraints, require further on the ground data collection, and would have the potential of missing key opportunities that may come up in the near future. So it was decided to look at and prioritize each watershed area, then identify issues affecting the health of these watersheds, and finally create strategies (not projects) to address these issues. Once strategies were determined, R2R would solicit partners to come in and initiate projects based on these findings and recommendations. The three watersheds in R2R's project area were prioritized in the following order: Priority 1: Chicken Creek; Priority 2: Cedar Creek; and Priority 3: Rock Creek. These priorities were determined based on the following:

1. Presence of Endangered or Threatened species
2. Stream reaches that are characterized as being "Very Good" or "Good" by Clean Water Services' Watersheds 2000 survey.
3. Wildlife habitat areas that received a score of 8 or 9 on a scale of 0-9 with 9 being highest in ecological value in Metro's 2002 Goal 5-Wildlife Habitat Model.
4. Less than twenty percent effective impervious area
5. Connectivity with already-protected lands.
6. Riparian corridor dimensions follow Metro's Goal 5 Riparian Model (*primary* riparian).

7. Existence of threats.

Following the prioritization of the three watersheds, twenty-eight strategies were identified to address the identified concerns. These strategies were divided into the following categories:

1. **Conservation (4 strategies)**
   a. Acquisitions/Easements Inside the UGB;
   b. Acquisitions/Easements Outside the UGB;
   c. Goal 5 Riparian Corridors and Wildlife Habitat
   d. Green Streets
2. **Restoration (5 strategies)**
   a. City Open Space Stewardship and Adoption Program
   b. Culvert Replacement
   c. Native Vegetation Restoration/Enhancement
   d. Stream Geomorphology
   e. Wetland Restoration/Enhancement
3. **Education/Outreach (13 strategies)**
   a. Adopt-a-River Program
   b. Building Watershed-Friendly Homeowner Associations
   c. Cedar Creek Greenway Field
   d. Cedar Creek Greenway Walks Program
   e. Citizen Watchdog Program
   f. Creating High School Watershed Stewards
   g. Homeowner Education Workshops
   h. NatureWatch Demonstration Garden
   i. Promotion of Watershed-Friendly Products and Services
   j. Rural Landowner Education and Outreach
   k. Water Bill Inserts
   l. Watershed Photography Course
   m. "Welcome to Sherwood's Watershed" Guidebook
4. **Assessment/Monitoring (6 strategies)**
   a. Fish and Wildlife Surveys for Cedar Creek Greenway
   b. Mapping Prior-Converted Wetlands
   c. Reassess Army Corps of Engineer Habitat Map
   d. Stream Surveys for Chicken and Cedar Creek Headwaters
   e. Water Quality Testing on Chicken Creek
   f. Review and Update Action Plan

As of January 2003, the descriptions of each strategy (listed above) have been completed and are ready to be incorporated into the action plan. In addition to the drafted strategies, maps were created to identify priority areas and locations where these strategies require implementation. As of April 2003, the maps are being finalized.

Currently work is underway to prepare the Action Plan for review by a list of reviewers, identified by R2R, to solicit input on the plan. Once this "peer reviewer" input is received, public input and participation will be solicited via an open house and public outreach. This work is scheduled to be completed by the fall of 2003 and funding has been secured (National Fish and Wildlife Foundation's (NFWF) Centennial Legacy Grant: $35,000) to hire a R2R Coordinator to finalize the Action Plan and begin implementation of its strategies.

Outreach and Capacity Building Activities

While the Conservation/Restoration Subcommittee has worked on developing the Watershed Action Plan, the other subcommittees have worked on promoting, building support, and increasing participation in Raindrops to Refuge.

The Homeowner Education Subcommittee and Youth Education Committee planned and sponsored several outreach and education activities during 2002. These activities sought to increase the public's awareness about R2R, Sherwood's watersheds, the Tualatin River National Wildlife Refuge, the City of Sherwood Greenway System, and actions citizens can take to protect and preserve the local watershed. The workshops, tours, presentations, articles in the local paper, and write-ups by project partners have all proven to be a great success due to increases in public recognition and participation and positive feedback. Additionally, the outreach activities that took place throughout the year will serve as an excellent primer for soliciting public input for the action plan, as well as build organizational capacity. During 2003, the Homeowner Education Subcommittee will continue coordinating workshops and tours, but the primary focus will be to sponsor a community-wide open house to solicit public input for the Action Plan and to further increase awareness about R2R and its efforts. The Youth Education Subcommittee will continue to find ways to increase environmental education opportunities for local youth, while addressing issues affecting watershed health.

The Capacity Building Task Team continued to work in increasing R2R's sustainability throughout the year by writing grants, soliciting partnerships, recruiting volunteers to work with R2R's committees, developing a 2-year Workplan, and further organizing and developing R2R to address the Workplan. This Team was successful in soliciting and receiving funding from the NFWF Centennial Legacy Grant and the Metropolitan Greenspaces Environmental Education Grant to support the Raindrops to Refuge Coordinator position, as well as funding to support R2R projects.

Conclusions

Raindrops to Refuge has proven to be a great success since its inception in 2001. R2R has received 3 awards for its efforts in improving watershed health and participation and recognition has steadily increased. Although, the Watershed Action Plan was not finalized during the project, due to over-optimistic objectives established prior to the project's initiation, the Action Plan has developed into a much stronger document than originally envisioned and with many of its strategies either already implemented or ready to be initiated by R2R's partners. Additionally, R2R began the project with 6 Advisory Committee members, no subcommittees, and involved 4 partnerships with agencies and outside organizations; now R2R has 31 participants involved in 1 Advisory Committee, 3

R2R Matching Contributions for 2002 (staff)

Agency/Organization	**Audubon Society of Portland**	Total
		$800.00
Agency/Organization	**City of Sherwood**	Total
		$5,537.18
Agency/Organization	**Clean Water Services**	Total
		$1,715.00
Agency/Organization	**Earth Force, PSU**	Total
		$262.50
Agency/Organization	**Metro**	Total
		$200.00
Agency/Organization	**Portland State University**	Total
		$6,804.00
Agency/Organization	**Sherwood City Council**	Total
		$52.00
Agency/Organization	**Sherwood Institute of Sustainability**	Total
		$3,763.50
Agency/Organization	**Sherwood School District**	Total
		$1,753.00
Agency/Organization	**Sherwood YMCA**	Total
		$315.50
Agency/Organization	**Three Rivers Land Conservancy**	Total
		$1,180.00
Agency/Organization	**Tualatin River Watershed Council**	Total
		$160.00
Agency/Organization	**Tualatin Riverkeepers**	Total
		$701.25
Agency/Organization	**US Fish and Wildlife Service**	Total
		$0.00
Agency/Organization	**Volunteer (Sherwood Resident)**	Total
		$3,107.50

R2R Matching Contributions for 2002 *(Funding, Materials, Services)*

Agency/Organization:	**City of Sherwood**	Total Value **$9,220.00**
Agency/Organization:	**Metro**	Total Value **$150.00**
Agency/Organization:	**Audubon Society of Portland**	Total Value **$150.00**
Agency/Organization:	**Sherwood YMCA**	Total Value **$600.00**
Agency/Organization:	**Earth Force, PSU**	Total Value **$370.00**
Agency/Organization:	**Boskey Dell Natives**	Total Value **$80.00**
Agency/Organization:	**Ash Creek Forestry**	Total Value **$80.00**
Agency/Organization:	**Regional Water Providers Consortium**	Total Value **$750.00**
Agency/Organization:	**Regional Arts Commision**	Total Value **$5,000.00**
Agency/Organization:	**YMCA Merrywalkers**	Total Value **$260.00**
Agency/Organization:	**Tualatin Basin Awareness Committee**	Total Value **$750.00**
Grand Total		**$17,410.00**

Attachment 3: Example of Conservation Strategy

C2: Acquisition/Easements Outside the Urban Growth Boundary

Description:

Steelhead habitat along main stem of Chicken Creek, RSAT CN24, Watersheds 2000 Survey

At present, Chicken, Rock and Cedar creek watersheds provide limited habitat for fish and wildlife, forested riparian areas and wetlands, and contiguous wildlife migration corridors along main stem reaches. Metro has identified high value wildlife habitat in all three watersheds as part of its Goal 5 program. A significant number of reaches within Chicken and Cedar creeks are in good condition, according to Clean Water Services' Watershed 2000 stream survey. ODFW reported in its *Distribution of Fish and Crayfish, and Measurement of Available Habitat in the Tualatin Basin Analysis* (ODFW, 2002), that reaches in all three streams support potential spawning and rearing habitat for ESA-listed, threatened steelhead and resident cutthroat trout. Sherwood's watersheds also benefit from locally and federally protected areas. The Tualatin River National Wildlife Refuge, one of only ten urban refuges in the nation, encompasses 1,253 acres of primarily floodplain habitats, much of that within Sherwood's watersheds. Refuge lands encompass the confluences of Rock and Chicken Creek with the Tualatin River, and protect the majority of the creeks' 100-year floodplain areas from future development. The City of Sherwood's Greenway and Open Space System protects almost the entire portion of Cedar Creek's primary riparian and floodplain areas that are within the urban growth boundary, as well as many of the City's remaining wetlands.

Numerous opportunities exist to expand and protect fish and wildlife habitat, migration corridors, and water quality in Sherwood's three watersheds. Almost three-fourths of these three watersheds are privately owned. Most of these lands are being used for agriculture, forestry or rapidly increasing rural residential development. R2R will seek willing landowners with local and regional land trusts and public agencies to conserve high priority fish and wildlife habitat, healthy forested riparian corridors, and headwaters within these three watersheds. Conservation tools may include land acquisitions and conservation easements to protect critical steelhead spawning and rearing habitat along the main stem of Chicken Creek. Other high priority conservation areas are headwater stream reaches characterized as being in "good" and "very good" condition in the Watersheds 2000 survey. High priority areas also include wildlife habitat areas that received a score of 8 or 9 on a scale of 0-9 with 9 being highest in ecological value in Metro's 2002 Goal 5-Wildlife Habitat Model. Also, wetlands identified in the National Wetland Inventory and the City of Sherwood's Local Wetland Inventory that were located within or adjacent to "high priority" habitat and headwater areas are considered high priority conservation areas. All high priority targets have less than twenty percent effective impervious area and provide connectivity with the Refuge and the City of Sherwood's Greenway System. Riparian corridor dimensions for reaches outside the urban growth boundary follow Metro's Goal 5 Riparian Model (*primary* riparian) and include all land within the 100-year floodplain as delineated by the Federal Emergency Management Agency. Of special note is the "high priority" target area just south of the City of Sherwood's urban growth boundary and north of Brookman Road. In December 2002 Metro Council approved including this area into the UGB for future development. R2R elevated this area to "high priority" due to the threat of development, connectivity with the City's Greenway and Cedar Creek headwaters, high value wildlife habitat (score of 7), and intact forested riparian areas as shown in the attached aerial.

"Priority" conservation targets include areas that support high value wildlife habitat (score of 7) in Metro's Goal 5 Wildlife Habitat Model and stream reaches characterized as being in "good" condition in the Watersheds 2000 Survey, with the exception of headwater areas that were promoted to "High Priority" status. R2R has crafted a different strategy to address conservation targets within the urban growth boundary in recognition of the City of Sherwood's efforts to permanently protect the riparian and floodplain areas of Cedar Creek.

Leads: Three Rivers Land Conservancy and R2R

Partners: NRCS, Clean Water Services, Metro, USFWS, Refuge and American Farmland Trust.

Potential Funding Sources:

- National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 and is dedicated to the conservation of fish, wildlife, and plants, and the habitat. The Foundation commits funds in the form of challenge grants, ensuring that the Foundation's funds are matched. Challenge grants are partially supported by congressionally appropriated dollars that must be matched by a ratio of one to one. Grants vary depending on the NFWF grant program and can range from $1,500 to $200,000. Contact: Suzanne Piluso, local grant administrator
- Programs administered by the Farm Service Agency, Washington County Soil and Water Conservation District and Natural Resource Conservation Service include the *Conservation Reserve Enhancement Program* (CREP), *Environmental Quality Incentives Program*, *Wetland Reserve Program* (WREP), and *Wildlife Habitat Incentive Program* (WHIP) for projects that create, restore or protect riparian areas, wildlife habitat, and wetlands. Contact: Matt Dunnahoe at matt-dunnahoe@or.nacdnet.org
- The ODFW's *Wildlife Habitat Conservation and Management Program* and *Riparian Tax Incentive Program* provide technical help, wildlife plans and tax incentives for projects that create improve, or protect wildlife habitat.
- The local OWEB Small Grants Team (TRWC, WCSWCD, West Multnomah SWCD and Tryon Creek Watershed Council) can provide funds for individual restoration projects (limited duration in 2003). Contact: Janelle St. Pierre or Pam Herinckx.
- Tualatin Valley Water Quality Endowment Fund carries out and supports research, monitoring, education and other activities leading to the restoration, enhancement, and maintenance of the integrity of the waters of the Tualatin River Basin and the State of Oregon. Contact: Sonnie Russill
- Metro Regional Parks and Greenspaces may be able to provide assistance if funds become available in the future. The agency may target lands identified on its Regional System concept for conservation and restoration.

Target Areas: See attached map.

Relationship to Other Planning Efforts or Projects:

Clean Water Services is developing its *Healthy Streams Plan* to address the Clean Water Act and Endangered Species Act mandates to protect fish and wildlife and water quality. Along with changes in policy and operations and maintenance, conservation may also help in meeting federal requirements.

Three Rivers Land Conservancy completed its Strategic Plan for conservation in the Portland metropolitan area. Sherwood's three watersheds, with special focus on upper reaches outside of the urban growth boundary, are one of seven priority areas identified by the regional land trust. R2R has been working closely with land trust staff to plan and pinpoint conservation opportunities based on the best available science, most recent surveys and watershed level planning.

The Refuge is still in the process of acquiring lands within the established refuge acquisition boundary. Acquisitions total 1203 acres with an additional 50 acres managed under agreement with Metro, leaving a total of 1805 acres remaining to be protected. Acquisitions have been and will be obtained only from willing sellers. Funding to support acquisitions come from a variety of sources, including the Land and Water Conservation Fund, flood relief funds, and federal hydroelectric power mitigation funds, but as these funding sources become limited the Refuge will need to look for alternative sources.

All acquired lands and easements will need to be monitored and actively managed and/or restored to enhance and protect natural resources, reduce impacts from adjacent land uses and enforce legal restrictions on development or land uses.

Benefit to Conservation Values or Management Goals:

Partnerships and conservation projects will permanently protect: 1) Undeveloped riparian corridors and floodplains that support native vegetation, fish and wildlife habitat and contribute to stream health, 2) Any remnant unique, declining and highly valuable habitats, and 3) Connectivity with existing riparian and wildlife corridors, and 4) Areas that help to reduce stormwater runoff.

Tool or Type of Source Control: Private voluntary land conservation tools, i.e. tax incentives, land transactions, bargain sales, riparian or wetland conservation easements, etc.

Potential Challenges:

Properties adjacent to the urban growth boundary or proposed for UGB inclusion can be extremely expensive. In addition, private landowners may be reluctant to donate, sell or limit development on their land for conservation purposes knowing that their property may be worth more to developers.

As with the USFWS and its depleted funds for expanding existing national refuges, funding for local land trusts to acquire land or easements is also shrinking, especially in the case of private foundations, the Oregon Watershed Enhancement Board and individual contributions.

All acquired lands and easements will need to be monitored and actively managed and/or restored to enhance and protect natural resources, reduce potential impacts from adjacent land uses and enforce legal restrictions on development or land uses. Consequently, when a nonprofit land trust acquires land or a conservation easement, it also requires donation of funds to establish a "stewardship endowment" fund. The purpose of this endowment is to use the interest from the principal to cover the inherent and ongoing costs associated with monitoring, managing and/or legally defending a property or easement. Most land trusts have found it extremely challenging to secure an "endowment" from private landowners or to solicit foundations, most of which will not support "endowments" of any kind.

Attachment 4: Example of Restoration Strategy

R5: Wetland Restoration and Enhancement

Description:

Habitat loss and degradation are the largest threats faced by wetland habitats, according to The Wetlands Joint Venture's Willamette Valley Plan. The spread of aggressive non-native plant species such as reed canary grass and purple loosestrife, and animal species such as the bullfrog and largemouth bass, have also had devastating effects on native wetland communities in these watersheds.

Potential wetland restoration in the Tualatin River

Land ownership is overwhelmingly private in Sherwood's three watersheds, with the lower reaches and confluence with the Tualatin River owned and managed by the U.S. Fish and Wildlife Service as the Tualatin River National Wildlife Refuge (Refuge). Some of the most significant remaining areas of wetland habitat are along the main stem riparian corridors of Chicken, Rock and Cedar Creek adjacent to protected lands within the Refuge and the City of Sherwood's Greenway. ODFW (ODFW) found in its Distribution of Fish and Crayfish, Measurement of Available Habitat in the Tualatin Basin Analysis (ODFW, 2002) that reaches in all three streams support potential spawning and rearing habitat for ESA-listed, threatened steelhead trout and resident cutthroat. Wetlands along the main stem of Rock and Cedar lie within and adjacent to already protected areas and the 100-year floodplain, and provide productive habitat for fish and wildlife.

The overall goals for wetland restoration are to restore native plant communities and hydrology, and to protect, restore and develop a diversity of habitats for migratory birds, resident and anadromous fish, amphibians, retiles and mammals. Wetlands being considered for restoration and/or enhancement should be individually surveyed, however. Management goals and objectives will vary depending on the current conditions and functions of an individual wetland or wetland complex.

Lead: Open

Partners: The Wetlands Joint Venture, Tualatin River National Wildlife Refuge, Natural Resource Conservation Service, Washington County SWCD, Three Rivers Land Conservancy, The Wetlands Conservancy, Metro Parks and Greenspaces Program, Clean Water Services, City of Sherwood and R2R.

Potential Funding Sources:

- Programs administered by the Farm Service Agency, Soil and Water Conservation District and Natural Resource Conservation Service include the *Conservation Reserve Enhancement Program* (CREP), *Environmental Quality Incentives Program* (EQIP), Wetland Reserve Program (WREP), and *Wildlife Habitat Incentive Program* (WHIP) for projects that create, restore or protect riparian areas, wildlife habitat, and wetlands. Contact: Bob App, NRCS District Conservationist, Washington County SWCD at (503) 648-3174
- Clean Water Services' small grant program supports community-based projects that focus on water quality education, involvement and restoration activities undertaken by community groups. They favor partnerships and projects that move beyond "us versus them" attitudes, emphasize water quality as a community resource, and leverage the efforts of volunteers and/or other funding resources. The average funding level is $500, but will allow a

maximum of $5,000 per project. Grant information provided on Clean Water Services' web site: http://www.cleanwaterservices.org. Select "Do my Part", then "Cooperative funding." Karen Bantes, Clean Water Services' Public Information Specialist, recommended that R2R apply for renewable funding to cover water bill insert printing costs.

- The local OWEB Small Grants Team (TRWC, WCSWCD, West Multnomah SWCD and Tryon Creek Watershed Council) can provide funds for individual restoration projects (limited duration in 2003). Contact: Janelle St. Pierre or Pam Herinckx at Washington County SWCD at (503) 648-3174
- Tualatin Valley Water Quality Endowment Fund carries out and supports research, monitoring, education and other activities leading to the restoration, enhancement, and maintenance of the integrity of the waters of the Tualatin River Basin and the State of Oregon. Contact: Sonnie Russill
- The ODFW's *Wildlife Habitat Conservation and Management Program* and *Riparian Tax Incentive Program* provide technical help, wildlife plans and tax incentives for projects that create improve, or protect wildlife habitat.
- USFWS' *Partners for Fish and Wildlife Program* funds projects to create, enhance, or restore wetlands and stream corridors on private lands. Contact: Amy Horstman, USFWS at Amy_Horstman@fws.gov
- The Greenspaces Program (USFWS/Metro partnership) provides conservation and restoration grants for projects that create, enhance, or restore wetlands and stream corridors on public or otherwise protected lands. Contact: Jennifer Thompson, USFWS at 503-231-6179 or Jennifer_Thompson@fws.gov
- National Fish and Wildlife Foundation (NFWF) was established by Congress in 1984 and dedicated to the conservation of fish, wildlife, and plants, and the habitat. The Foundation commits funds in the form of challenge grants, ensuring that the Foundation's funds are matched. Challenge grants are partially supported by congressionally appropriated dollars that must be matched by a ratio of one to one. Contact: Suzanne Piluso, local administrator.
- The National Association of Counties (NACo) and the Five Star Restoration Grant Program assist community-led initiatives that focus on wetland and watershed restoration. Project sites can be public land, such as parks, streams, and school campuses, or private land, such as corporate facilities. The partnership provides a small amount of seed money ($10,000 - $20,000 per project) that leverages a much larger amount of funds and serves already in place and coordinated by grantee. For more information and application guidelines: http://www.naco.org/programs/environ/water/grants.cfm or contact Jason Shedlock at 202-942-4252 or jshedloc@naco.org

Target Areas:

R2R used both the National Wetland Inventory (NWI) and the City of Sherwood's Local Wetland Inventory (LWI) to locate existing wetlands in Rock, Cedar and Chicken Creek Watersheds. The NWI inventoried wetlands watershed wide, while the LWI focused only on wetlands within the City of Sherwood. R2R developed the following criteria to identify wetland restoration priorities. These four criteria represent the same parameters used to identify "High Priority" conservation areas outside the Urban Growth Boundary (Strategy C2), with the exceptions of headwater areas. Wetlands selected as "High Priority" for restoration met two or more of the following criteria (map attached):

1. Contribute to potential spawning and rearing habitat for Upper Willamette River Steelhead in Chicken Creek
2. Located within or adjacent to already protected lands, i.e. Refuge and Creek Greenway
3. Located within primary riparian corridors as identified in Metro's Goal 5 Program for riparian protection

4. Located within wildlife habitat areas (score of 8 and 9) as identified in Metro's Goal 5 program for wildlife habitat protection

(Thanks to: Esther Lev of The Wetlands Conservancy, "The Willamette Plan" developed by the Wetlands Joint Venture and expertise of R2R Conservation/Restoration Sub Committee members for background information used to develop criteria)

Partners and funding sources will vary depending on whether a wetland is on private or public land. Recognizing this difference, "High Priority" wetland areas have been divided into two categories: private lands (red) and public lands (orange). Wetlands that did not meet two or more of the above criteria were still identified as restoration priorities (yellow). R2R recognizes that all wetlands provide important functions critical to overall watershed health. Enhancement of any existing wetland should be considered as opportunities arise. In identifying "high priority" wetlands, R2R is prioritizing sites that compliment other Action Plan recommendations, i.e. "Acquisition and Easements."

Relationship to Other Planning Efforts or Projects (MAP):

A reference map showing the areas currently being restored or planned for restoration within the Refuge and the City Greenway is attached. Partners who want to pursue wetland conservation and restoration in Rock, Cedar and/or Chicken Creek should contact Refuge land managers and/or city planners to coordinate their efforts.

All regulatory and statutory requirements must be completed prior to implementing a specific project. Geographic location and nature of the project will dictate the action and permits required. Below are the agencies that administer the regulatory and statutory requirements for all wetland related projects in Oregon:

- U.S. Army Corps of Engineers/OR Dept of Environmental Quality: Clean Water Act 404 Permits
- Division of State Lands: Permit for filling, draining, restoring or enhancing wetlands
- National Marine Fisheries Service/U.S. Fish and Wildlife Service: ESA Section 7 Consultation

Benefit to Conservation Values or Management Goals:

Wetland restoration will restore and protect native plant communities and hydrology, and protect and restore a diversity of habitats for fish and wildlife.

Tool or Type of Source Control: Restoration and enhancement projects on both private and public lands.

Other Examples to Guide Project:

The Wetlands Conservancy has managed several wetland restoration projects in the Portland metropolitan area with many "lessons learned" to share with others embarking on wetland restoration. Contact: Esther Lev.

Land management objectives of the Tualatin River National Wildlife Refuge are centered on protection, restoration, and enhancement of riverine floodplains, wetlands, riparian areas, and uplands adjacent to the Tualatin River. Much of the Refuge's wetland restoration work has been focused on restoring hydrology of natural floodplain wetlands that have been altered or drained by human manipulation. The goal of the Refuge's habitat restoration program is to restore a diversity of native habitats and associated populations of indigenous fish, wildlife, invertebrate, and plant species of the Tualatin River basin. Prior to proposing or beginning a wetland restoration and/or enhancement project in any one of Sherwood's three watersheds, partners should consult with Deputy Refuge Manager Chris Lapp.

Potential Challenges:

Noxious and invasive plant species threaten the success of many wetland restoration and enhancement activities. When these species become established on a developing site they can out-compete & displace native species, reduce wildlife habitat potential, alter natural ecosystem processes, and limit overall biodiversity. Although no site is immune from the chance dispersal of problem species, some sites are more predisposed than others to an infestation of non-native invasive species. In particular, a restoration site may be at more risk of an invasion based on its location in the landscape, altered hydrology, proximity to existing seed sources, project design, and the success of the restoration planting and oval survival of the native species. It is important to consider a site's risk to invasion in the planning process and to perform regular follow-up monitoring to identify chance introductions. With early detection, a problem species is easier to contain or eradicate than when it is fully established. For once it is established, it may be difficult or impossible to control or eliminate, and often attempts to do so adversely impact remnant native vegetation.[2] Long term maintenance and invasive species management for the first three years are the most critical for project success, according to Washington County SWCD staff.

[2] Information from the Wetland Science Institute's web page: http://www.pwrc.nbs.gov/WLI/wris1.htm

Attachment 5: Example of Education/Outreach Strategy

E7: Homeowner Education Workshops

Description:

Sponsor workshops for watershed residents to learn about the Tualatin River National Wildlife Refuge, City greenway and open spaces, watershed functions and the impact of homeowner landscaping practices. Workshops will provide residents the information and resources about water conservation, stormwater management, alternative pest and weed management techniques, native plants and trees, and fish and wildlife habitat. With this information and resources, homeowners will be motivated to alter behaviors that are/may be harming watershed health and take actions to improve these natural resources.

Neighbor-to-Neighbor Homeowner Workshop at the YMCA, July 2002

Two workshop formats will be used. The first format is a "community-wide" workshop hosted by R2R in a Sherwood location. R2R will partner with East Multnomah SWCD and Naturescaping for Clean Rivers presenters to host a "Community-wide Workshop" that will be available to everyone living in the Portland metropolitan area. Naturescaping for Clean Rivers will manage participant requests, confirmations and follow up, departing gifts, presentations, handouts and field trip. R2R will publicize events and assist with on-site logistics.

The second format is more informal and neighborhood-oriented. These workshops will highlight local resources, their benefits and problems and how homeowner behaviors affect them. R2R will work with partners to develop an outline of workshop goals, objectives, topics and handout material to share with new presenters and potential hosts. R2R will recruit Sherwood homeowners to co-host a "Neighbor to Neighbor" workshop or workshop series in their homes or at a community-gathering place in Sherwood. Homeowner hosts are responsible for inviting their friends and neighbors to attend the event and serve as workshop co-host. R2R will work with homeowner hosts to develop invitations, flyers and other promotional materials. R2R will also schedule presenters, bring handouts and materials, provide native plants for departing gifts, publicize event and confirm guests.

In addition to the workshop, participants will be invited to take part in a free pre-workshop bird or nature walk along the Cedar Creek Greenway with an R2R guide. These 60-minute walks will be scheduled one hour before the workshop and the guide will meet participants at the workshop venue.

Lead: R2R

Partners: City of Sherwood, East Multnomah SWCD, AmeriCorps, Naturescaping for Clean Rivers, Naturesheds Inc., Tualatin River National Wildlife Refuge, Tualatin Basin Public Awareness Committee and the Audubon Society of Portland

Funding Source: The Greenspaces Program (USFWS/Metro partnership) awarded funding in December 2003 to support R2R's Homeowner Education Program.

Target Constituencies: All watershed residents, but particularly homeowners living adjacent to a creek, City's public greenway and/or the Tualatin River National Wildlife Refuge.

Relationship to Other Planning Efforts or Projects: Publicize workshops at Cedar Creek Greenway Walks, in water bill announcements and inserts, student backpack mail and flyers at homeowner association meetings.

Incorporate bird walks and/or nature walks as a pre-workshop event to introduce residents to public greenways, Cedar Creek and local wildlife. If a naturescaped demonstration garden is created in the City of Sherwood, incorporate the garden into workshop presentations, bird/nature walks and field trips.

Benefit to Conservation Values or Management Goals:

As homeowners become aware of the interconnectedness of nature, they will be more motivated to change their behavior to protect local streams, wildlife habitat, water quality, public greenways and the Refuge. R2R's Homeowner Education will encourage homeowners to:

- Landscape with native plants to reduce watering and pesticides and herbicides use
- Avoid purchasing and planting exotic species that are known to be invasive
- Reduce size of lawns or leave lawn clippings on the ground
- Protect existing or restore fish and wildlife habitat in their yards and along public greenway
- Allow lawns to go dormant during the summer to reduce water use
- Use integrated pest and weed management techniques
- Reduce dumping and encroachment incidents along public greenway
- Encourage homeowner associations to change landscaping and lawn requirements
- Support and participate in volunteer restoration efforts within the City greenway and on the Refuge

Tool or Type of Source Control: Homeowner Education

Examples to Guide Project: Naturescaping for Clean Rivers Program

Potential Challenges:

Two of the workshops co-hosted by R2R and homeowners in 2002 had lower turnout than expected– approximately eight to twelve people. It has been challenging to identify a time of the year when residents are available and/or interested in attending a workshop. More than forty people registered for the Community-wide Workshop co-hosted by R2R and Naturescaping for Clean Rivers Program in October 2002. R2R is reviewing the types of publicity used to promote the October workshop and will repeat them to promote future workshops and reach a larger percentage of the Sherwood population.

Attachment 6: Example of Assessment/Monitoring Strategy

A5: Water Quality Testing for Chicken Creek

Refuge Club members conducting water quality monitoring on Chicken Creek

Description:

Obtaining accurate water quality data for Chicken Creek will be critical and timely as more than 80 acres in and near the confluence of Chicken and Cedar creek will be incorporated into the urban growth boundary in 2003, leading to rapid development in undeveloped uplands and riparian areas. Moreover, the lower main stem of Chicken Creek is mostly forested and characterized as being in "good" condition based on Clean Water Services' Watersheds 2000 survey. The lower main stem currently supports spawning and rearing habitat for resident cutthroat trout and ESA-threatened steelhead. R2R is encouraging teachers in Sherwood Middle School and High School to expand existing student water quality monitoring in Rock and Cedar Creeks to include Chicken Creek

Local teachers and students from Sherwood Middle School and Sherwood High School have been partnering with Student Watershed Research Project (SWRP) to conduct water quality testing for Cedar and Rock creeks. High school students and teacher April Duwees regularly submit their field samples to SWRP by web; due to the overlap with the high school students, middle school students and teacher Dorene Steffeck do not submit their samples. SWRP tests submitted data against its quality assurance/quality control program to provide local agencies and jurisdictions reliable data for policy and community decision-making. Students are encouraged to recognize the value and impact of their studies on the management of local watersheds.

R2R and its partners are working with the teachers on two grant proposals to purchase water quality testing chemicals and field supplies and cover transportation costs. These two grants will enable Dorene to augment and continue student water quality testing on Cedar Creek and begin submitting field samples to SWRP. Grant funding will also allow April to shift her high school students from Cedar Creek to SWRP-assigned sites on Chicken. April and her students will continue to submit results for Rock Creek, along with data from new testing sites on Chicken. Proposed date for implementing water quality testing on Chicken Creek is in fall of 2003.

Lead: R2R

Partners: Teachers and students from Sherwood Middle and High Schools, and AmeriCorps

SWRP relies on the cooperation of teachers, students, scientists, businesses, governmental agencies, and community groups to couple watershed education with the collection of high quality data. Its mission is to develop awareness, knowledge, skills, and commitment leading to responsible behavior and constructive actions with regard to water quality and watershed resources. SWRP will work directly with teachers, students, R2R, Clean Water Services and the City of Sherwood to determine which water quality parameters are needed and how students will collect and report that information for a specific stream, reach or site. For contact and information: http://www.swrp.org/

Potential Funding Sources:

- The Diack Foundation provides funding for school related programs up to $1500
- H.J. Weddle Foundation provides funding for environmental education programs
- Project GREEN offers inexpensive water quality testing chemicals and kits

- Sherwood School Foundation
- The Greenspaces Program, administered in partnership with Metro and USFWS

Relationship to Other Planning Efforts or Projects:

Sherwood Middle School students and teacher will need to raise the quality of data collected and begin submitting data to SWRP for Cedar Creek before Sherwood High School students and teacher will shift from Cedar to Chicken Creek.

High school teacher April Duwees will offer an advanced Natural Science course for sophomores, juniors and seniors to participate in water quality monitoring activities on Rock and Chicken Creek in the 2003/2004 school year.

Benefit to Conservation Values or Management Goals:

Data collection and monitoring of water quality data for Chicken Creek will enable R2R, its partners and local agencies and jurisdictions responsible for water quality and ESA requirements, to better monitor and address the impacts of increased development and impervious surface area, current and future land uses, and conservation and restoration efforts in the Chicken Creek watershed.

Tool or Type of Source Control: Youth education and stewardship and water quality monitoring to identify problems and inform decisions-makers so problems can be addressed quickly and effectively.

Potential Challenges:

Public schools in the state of Oregon are facing severe budget cuts, a reduced school year, larger class sizes and decreased funds for extracurricular activities and programs. These challenges will make it extremely difficult to launch this project in the current school year. However, both teachers continue to express interest in the proposal and are working with R2R and its partners, e.g. Janet Bechtold, to submit grant proposals for water quality testing chemicals, field equipment and transportation costs.

Attachment 6: Photos

R2R Advisory Committee Meeting

Conservation and Restoration Subcommittee Reviewing Data

Ken Huffer and Christine Egan Accepting Tualatin River Watershed Council Award for Outstanding Community Group

Patt Opdyke Presenting at a Neighbor to Neighbor Workshop about Natural Gardening

R2R Partners

- Sherwood Residents
- Students and teachers of the Sherwood School District
- U.S. Fish & Wildlife Service
- Tualatin River National Wildlife Refuge
- City of Sherwood
- Tualatin Riverkeepers
- Audubon Society of Portland
- Friends of the Refuge
- Institute of Sustainable Sherwood
- YMCA Earth Service Corps

What Can I Do?

If you would like to get involved with Raindrops to Refuge or learn more about our homeowner education workshops, youth learning programs, and Conservation and Restoration Action Plan and opportunities, please contact us:

R2R Advisory Committee
City of Sherwood
20 NW Washington Street
Sherwood, Oregon 97140

Phone: 503-625-4223
Fax: 503-625-5524
Email: eganc@sherwood.or.us

R2R Advisory Committee
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20 NW Washington Street
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Printed on recycled paper

Raindrops to Refuge

A Sherwood Community Watershed Stewardship Initiative

Our Mission:

To inspire, educate and facilitate community actions to assess, restore and preserve the ecological health of Sherwood's watersheds

Who are We?

Raindrops to Refuge (R2R) is a community-based effort to inspire and facilitate community actions and cooperation to protect and restore Sherwood's watersheds.

Sherwood's Watersheds

The watersheds are formed by three streams, Rock, Cedar and Chicken creeks and cover 23 square miles. They begin as trickles from hillsides outside the City of Sherwood and meander down into and through the city, neighborhoods and surrounding rural areas. Eventually, the creeks flow into the Tualatin River and Tualatin River National Wildlife Refuge. The trees, plants, fields and trails along the creeks provide important fish and wildlife habitat, flood protection, water quality and enjoyment for people.

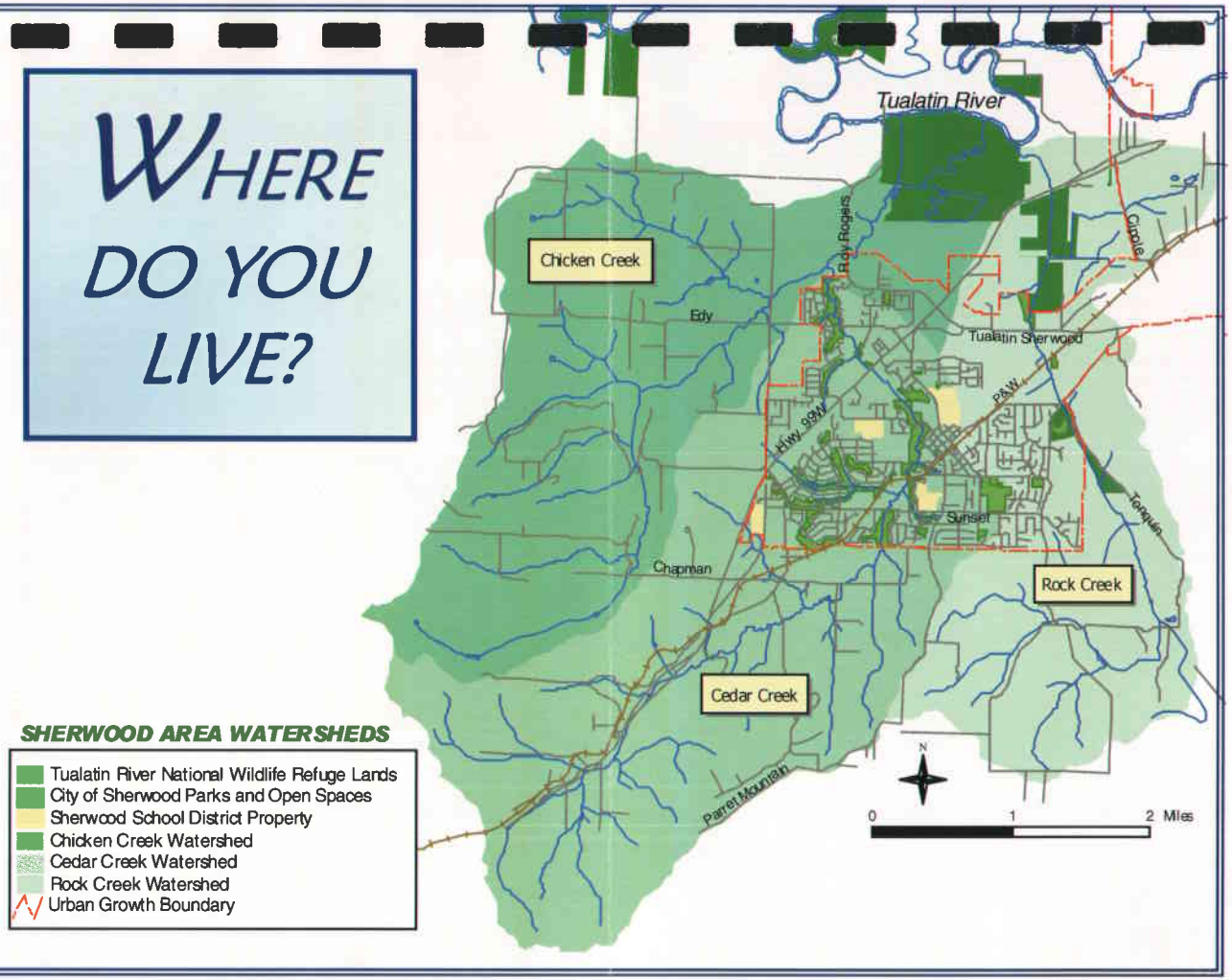
How You affect the Watershed

Whether you live two feet or two miles from the nearest stream, your activities as a watershed resident impact the creeks and Refuge's ability to provide wildlife habitat, flood protection, water quality and a safe and enjoyable place for people.

What is a Watershed?

The land that drains into a river or creek and is separated from other watersheds by ridge tops. The health of that water is affected by everything that happens within the watershed.

WHERE DO YOU LIVE?



SHERWOOD AREA WATERSHEDS

- Tualatin River National Wildlife Refuge Lands
- City of Sherwood Parks and Open Spaces
- Sherwood School District Property
- Chicken Creek Watershed
- Cedar Creek Watershed
- Rock Creek Watershed
- Urban Growth Boundary

R2R Goals:

CONSERVATION

- Partner with local landowners and land trusts o promote private land conservation and stewardship
- Identify lands to be acquired by City of Sherwood or local land trusts to protect habitat, improve water quality and expand greenway and trails
- Work with city planners to identify wildlife habitat resources in accordance with state land use laws

RESTORATION

- Develop and implement Watershed Action Plan w/R2R partners
- Identify and prioritize sites for habitat and stream restoration
- Organize work parties to plant trees, remove invasive species and clean up sites

OUTREACH

- Show Sherwood residents how their activities impact local creeks and the Refuge
- Motivate residents to participate in watershed restoration and education programs

EDUCATION

- Partner with Sherwood youth to map, monitor and restore local creeks
- Organize natural gardening workshops and bird walks for people living in Sherwood's watersheds
- Coordinate wildlife and plant assessments for Cedar Creek with Portland State University and Sherwood youth